

**46th Annual
Western Weights and Measures Association Technical Conference**

**FINAL REPORT of the
SPECIFICATIONS AND TOLERANCES COMMITTEE**

September 14-19, 2003
Fresno, California

Introduction

The Specifications and Tolerances (S&T) Committee addressed the following items at the 46th Annual WWMA Technical Conference. All agenda items are listed in Table A by Reference Key Number, title, and page number. Reference Key Numbers are assigned from the subject series listed below. The headings and subjects apply to NIST Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices."

All items on the agenda were presented for consideration and comment during open hearings conducted Monday, September 15, 2003. Following the receipt of comments and recommendations during the open hearings, the Committee withdrew some items, designated some as "informational" for additional study, designated some as "developmental," and made specific recommendations for changes to NIST Handbook 44 which were presented for vote at the voting session held Thursday, September 18, 2003. All "voting" and "voting consent" items presented to the general membership were approved and are presented as the recommendations of the Western Weights and Measures Association for consideration by the National Conference on Weights and Measures at its Interim Meeting scheduled for January 25-28, 2004, in Bethesda, Maryland.

Suggested revisions to the handbook are shown in **bold face print** and designated by ~~crossing out~~ what is to be deleted and underlining what is to be added. Requirements proposed to be non-retroactive are printed in *italics*. Entirely new paragraphs or sections proposed for addition to the handbook are designated as such and shown in **bold face type**.

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Scales Code	320 Series
Belt Conveyor Scale Systems Code	321 Series
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Weights Code	323 Series
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WWMA Specifications and Tolerances Committee
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Details of all Items(In order by Reference Key Number)

310 General Code**310-1 I G-S.1. Identification; Built-for-Purpose Software Based Devices;
Appendix D - Definition of Not-Built-For-Purpose Device**

Source: Carryover Item 310-1B. (This item originated from the NCWM S&T Committee, when Item 310-1 was split into 310-1A and 310-1B at the NCWM 2003 Annual Meeting.)

Discussion: During the 2003 NCWM Annual Meeting, the Committee agreed to split Item 310-1, a proposal to modify paragraph G-S.1. Identification to address software based devices, into two parts Item 310-1A and 310-1B. Voting Item 310-1A, a proposal to define “built-for-purpose” software based devices and to require marking specific identification information on “not-built-for-purpose” software based devices, was adopted. Information Item 310-1B, a corresponding proposal to define “built-for-purpose” software based devices and to require identification markings for “not-built-for-purpose” software based devices, appears in the recommendation below. Industry provided the Committee with language because its representatives indicated there was a need to address both “not-built-for-purpose” software based devices and “built-for-purpose” software based devices. The Committee heard no opposition to a requirement for identification markings for “built-for-purpose” software based devices similar to those required for “not-built-for-purpose” software based devices. The Committee kept the proposal regarding “built-for-purpose” software based devices an information item to allow for further review and development by the NTETC Weighing and Measuring Sectors and the regional weights and measures associations.

G-S.1. Identification. – All equipment, except weights and separate parts necessary to the measurement process but not having any metrological effect, shall be clearly and permanently marked for the purposes of identification ~~with the following information.~~ The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device.

G-S.1.1. Required Information. Equipment utilizing a plate or badge for identification must be permanently marked with the following information:

- (a) the name, initials, or trademark of the manufacturer or distributor;
- (b) model designation that positively identifies the pattern or design of the device;
- (c) *the model designation shall be prefaced by the term "Model," "Type," or "Pattern." These terms may be followed by the term "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). The abbreviation for the word "Model" shall be "Mod" or "Mod."*
[Nonretroactive January 1, 2003]
(Added 2000) (Amended 2001)

[Note: Prefix lettering may be initial capitals, all capitals or all lower case.]

- (d) *except for equipment with no moving or electronic component parts and not-built-for-purpose software based devices, a nonrepetitive serial number;*
[Nonretroactive as of January 1, 1968]
- (e) *for not-built-for-purpose, software based devices the current software version designation;*
- (f) *the serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number; and*
[Nonretroactive as of January 1, 1986]

- (g) *the serial number shall be prefaced by the words "Serial Number" or an abbreviation of that term. Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No, and S No.)*
[Nonretroactive as of January 1, 2001]
- (h) *for devices that have an NTEP Certificate of Conformance (CC) Number or a corresponding CC addendum number, the NTEP CC shall be prefaced by the terms "NTEP CC," "CC," or "Approval." These terms may be followed by the term "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.)*
[Nonretroactive as of January 1, 2003]

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device.
 (Amended 1985, 1991, 1999 and 2000)

G-S.1.1. Not-Built-for-Purpose Devices, Software Based. — For not-built-for-purpose, software based devices, the following shall apply:

G-S.1.2. For built-for-purpose, software based devices with display capability, the following shall apply:

(a) the manufacturer or distributor and the model designation be continuously displayed or marked on the device (see note below), or

(b) the Certificate of Conformance (CC) Number be continuously displayed or marked on the device (see note below), or

(c) all required information in G-S.1.1. Identification. (a), (b), (c), (e), and (h) be continuously displayed. Alternatively, a clearly identified System Identification, G-S.1. Identification, or Weights and Measures Identification shall be accessible through the "Help" menu. Required information includes that information necessary to identify that the software in the device is the same type that was evaluated.

Note: Clear instructions for accessing the remaining required G-S.1.1. information shall be listed on the CC. Required information includes that information necessary to identify that the software in the device is the same type that was evaluated.
[Nonretroactive as of January 1, 2004]

(a) All information defined in G-S.1.1. shall be either marked on the unit or continuously displayed. Alternative markings are:

1. the manufacturer or distributor name and the model number, or

2. the Certificate of Conformance (CC) Number, provided that access to the remaining G-S.1.1. information is available through the "Help" key, or clear instructions are listed on the CC.

(b) Information necessary to identify that the software in the device is the same type that was evaluated.

G-S.1.3. For not built-for-purpose, software based devices, the following shall apply:

(a) All information defined in G-S.1.1. (a), (b), (c) and (g) shall be either marked on the unit or continuously displayed. Alternative marking requirements are:

1. the manufacturer or distributor name and the model number, or

2. the Certificate of Conformance (CC) Number.

Provided that access to the remaining required G-S.1.1. information is available through the "Help" key or clear instructions are listed on the CC.

G-S.1.24. Remanufactured Devices and Remanufactured Main Elements. All remanufactured devices and remanufactured main elements shall be clearly and permanently marked for the purpose of identification with the following information:

(a) *the name, initials, or trademark of the last remanufacturer or distributor;*

(b) *the remanufacturer's or distributor's model designation if different than the original model designation.*
[Nonretroactive as of January 1, 2002]

Add the following definition to Handbook 44:

not built-for-purpose device. *Any main device or element which was not originally manufactured with the intent that it be used as, or part of, a weighing or measuring device or system*

2003 WWMA Recommendation:

The Western Weights and Measures Association (WWMA) Specifications and Tolerance (S&T) Committee heard comments from weighing device manufacturers and NIST stating that the proposed language is confusing and cluttered. It was also reported that SMA was planning to amend its proposal and submit amended language at the 2004 NCWM Interim Meeting.

The WWMA agreed that there appears to be no opposition to allowing alternate methods for providing required identification information marking on built-for-purpose software-based devices and supports the concept of allowing not-built-for-purpose software-based devices to display G-S.1. Identification information provided that the physical identification information contains the following minimum information: manufacturer or distributor, model designation, and serial number.

The WWMA recommends that this item remain informational until it can be further developed.

320 Scales

320-1 V S.1.12. Manual Gross Weight Entries and UR.3.9. Use of Manual Gross Weight Entries

Source: Carryover Item 320-1. (This item originated from the Western Weights and Measures Association (WWMA) and first appeared on the Committee's 2002 agenda.)

Proposal Considered: Modify paragraphs S.1.12. and UR.3.9. as follows:

S.1.12. Manual ~~Gross~~ Weight Entries. – *A device shall accept an entry of a manual ~~gross~~ weight value only when the scale is at gross load zero and the scale gross or net* weight indication is at zero ~~in the gross weights display mode~~. Recorded manual weight entries except those on labels generated for packages of standard weights, shall identify the weight value as a manual weight entry by one of the following terms: "Manual Weight," "Manual Wt," or "MAN W." The use of a symbol to identify multiple manual weight entries on a single document is permitted, provided that the symbol is defined on the same page on which the manual weight entries appear and the definition of the symbol is automatically printed by the recording element as part of the document.*

[Nonretroactive as of January 1, 1993]

*[*Nonretroactive as of January 1, 2004.]*

UR.3.9. Use of Manual Gross Weight Entries. – *Manual gross weight entries are permitted for use in the following applications only: (1) on a point-of-sales system interfaced with scales when credit is given for a weighed item ~~on point-of-sale systems interfaced with scales, or when an item is pre-weighed and marked with the correct net weight~~; (2) when a device or system is generating labels for standard weight packages; (3) when postal scales or weight classifiers are generating manifests for packages to be picked up at a later time; and (4) on livestock scale and vehicle scale systems generate weight tickets to correct erroneous tickets.*

Discussion: The proposal was developed to address concerns about practices for using manual weight entries on point-of-sale (POS) systems. One national grocery company manually enters weights into its POS system when an item (e.g., watermelons, turkeys, roasts, etc.) exceeds the capacity of the POS scale system or when the scanner system cannot read the Universal Product Code (UPC) on a random weight package, but the weight and price per pound are legible. These applications are not specifically addressed in NIST Handbook 44 for use of manual weight entries.

Several restrictions are placed on the use of manual weight entries in Handbook 44 to deter fraudulent use of the feature and to ensure that entries are properly identified. Paragraph UR.3.9. permits the use of manual weight entries in applications where a credit is given on a POS system, to generate labels for standard weight packages, for postal weight manifests when packages are picked up at a later time, or to correct erroneous tickets generated by livestock or vehicle scales. Paragraph S.1.12. permits manual weight entries only when the scale is at gross load zero and the scale indication is zero. Paragraph S.1.12. also specifies that manual weight entries must be identified with specific terminology on labels (except standard weight packages) or tickets. The Committee had concerns that adding more applications to the list of acceptable weighing operations, where manual entries are permitted, might not adequately recognize all weighing installations where manual weight entries are appropriate.

At the July 2002 NCWM Annual Meeting, the Committee recommended a more complete assessment of the field use of manual weight entries since not all involve gross weights. The Committee reviewed several proposals to modify paragraph UR.3.9. to address specific manual weight entry applications encountered by each submitter. The Committee agreed that the use of manual weight entries occurs with both gross and net weight packages, therefore, the proposals to modify paragraph UR.3.9., as worded, did not address all instances where manual weight entries occur. The Committee also discussed a proposal, developed by the Committee at the 2002 NCWM Interim Meeting, to address the various manual weight entries that occur nationally in weighing operations. The proposal modified paragraph S.1.12. to recognize manual weight entries for both gross and net weight packages and to require the system to identify and print manual tare entries.

The Committee agreed that changes were also necessary to paragraph UR.3.9. to ensure that the requirement is consistent with the proposed modifications to paragraph S.1.12. The Committee agreed to consider recommendations to modify paragraph UR.3.9. because corresponding changes are needed for device operators that use manual weight entries.

In September 2002, the Committee heard support from the WWMA to modify paragraph UR.3.9. to recognize manual weight entries on POS systems for marking the correct weight on pre-weighed item. The WWMA indicated that it is acceptable to manually enter weight and price information and use the POS system as a calculator. The WWMA also removed all references to the term "gross" from paragraph UR.3.9. to correspond with the changes recommended for paragraph S.1.12.

During the 2003 NCWM Interim Meeting, scale manufacturers indicated it would be too costly to require devices to print manual tare values. Scale manufacturers supported an alternate proposal to modify paragraph S.1.12. to specify that only "direct sale" devices accept manual weight entries.

The Committee was not certain that the WWMA proposal as written in paragraph UR.3.9. clearly identified which applications are permitted to use manual weight entries. Additionally, the Committee was not certain that the proposal permits manual weight entries for random weight packages. The Committee agreed that the proposed language in paragraph S.1.12. may be misleading as to whether or not the device must print the value for each keyboard-, stored-, push-button- or digitally entered tare. Consequently, the Committee deleted any requirement to identify and print manual tare values on labels or recorded representation from paragraph S.1.12. The Committee also modified the proposal to clarify what are acceptable manual weight entries for point-of-sale systems and that the application in paragraph S.1.12. would be effective on January 1, 2004 for manual net weight entries. However, the Committee may wish to consider keeping the original effective date of January 1, 1993 for simplicity since manual gross and net weight entries already occur and both entries would now be acceptable. The Committee believes these modifications provide the flexibility grocers need to make manual weight entries while there are sufficient safeguards to prevent fraudulent use of the feature.

During the 2003 NCWM Annual Meeting, the Committee acknowledged that there are specific weighing applications in which manual gross weight entries are permissible. However, Handbook 44 does not include language to address every transaction that might use the manual weight entry feature and require the recorded value to be identified to prevent fraudulent use of the feature. Handbook 44 specifies that the scale must be at gross load zero and the scale indication is zero in the gross weight display, thus the customer realizes that a manual weight entry is taking place.

In the early 1990s, the S&T Committee could not foresee all possible uses of manual weight entries on point-of-sale systems. The Committee believes the current requirements were not intended to prohibit manual weight entries to calculate a new price. Paragraphs S.1.12. Manual Gross Weight Entries and UR.3.9. Use of Manual Gross Weight Entries would permit a point-of-sale system interfaced with a scale to give credit for a net weighed item or when an item is pre-weighed and marked with the correct net weight.

The Committee acknowledges there is confusion about what values are represented in a transaction, in part, because Handbook 44 does not include definitions for the terms “gross,” “net,” and “tare.” Handbook 130 (Weights and Measures Law Section 1.10) defines “net weight” and Publication 14 addresses push-button, keyboard and programmable, digital, and stored tares. The Committee believes future work on manual weight entry requirements may require defining those terms to clarify what values are appropriate for manual weight entries.

The Committee agreed with industry’s concerns about how the proposed modification to paragraph S.1.12. will restrict acceptable manual weight entries such as keyboard tare entries and tare determined on vehicle weigh-in/weigh-out systems. Therefore, the Committee changed the proposal to an information item and recommends that the Weighing Sector revisit the language to clarify the original intended use the manual weight entry feature in existing and other applications that are the result of new technology and today’s marketing practices e.g., tier pricing.

For more background information, refer to the 2002 and 2003 (pending publication) S&T Final Report.

2003 WWMA Recommendation:

The WWMA S&T Committee heard testimony that the proposed wording introduces difficulties for entering preset tare values with weight (load) on scales used for direct sales and suggested that the language be amended to limit manual weights to either gross or net weights. The Committee considered an alternate proposal to limit the use of manual weight entries to point-of-sale systems, but the committee believed that to be too restrictive.

The WWMA recommends the proposal be amended as follows:

S.1.12. Manual ~~Gross~~ Weight Entries. – A device shall accept an entry of a manual gross or net weight value only when the scale is at gross load zero and the scale gross or net weight indication is at zero ~~in the gross weights display mode~~. Recorded manual weight entries, except those on labels generated for packages of standard weights, shall identify the weight value as a manual weight entry by one of the following terms: “Manual Weight,” “Manual Wt,” or “MAN W.” The use of a symbol to identify multiple manual weight entries on a single document is permitted, provided that the symbol is defined on the same page on which the manual weight entries appear and the definition of the symbol is automatically printed by the recording element as part of the document.*

[Nonretroactive as of January 1, 1993]

*[*Nonretroactive as of January 1, 200X.]*

UR.3.9. Use of Manual ~~Gross~~ Weight Entries. – Manual gross or net weight entries are permitted for use in the following applications only: (1) on a point-of-sales system interfaced with scales when credit is given for a weighed item ~~on point of sale systems interfaced with scales, or when an item is pre-weighed and marked with the correct net weight~~; (2) when a device or system is generating labels for standard weight packages; (3) when postal scales or weight classifiers are generating manifests for packages to be picked up at a later time; and (4) on livestock scale and vehicle scale systems that generate weight tickets to correct erroneous tickets.

320-2 W S.6.4. Railway Track Scales

Source: Carryover Item 320-3. (This item originated from the Central Weights and Measures Association (CWMA) and first appeared on the Committee's 2003 agenda.)

Proposal Considered: Modify paragraph S.6.4. in the Scales Code as follows:

S.6.4. Railway Track Scales. – A railway track scale shall be marked with the maximum capacity of each section of the load-receiving element of the scale. Such marking shall be accurately and conspicuously presented on, or adjacent to, the identification or nomenclature plate that is attached to the indicating element of the scale. ~~The nominal capacity of a scale with more than two sections shall not exceed twice its rated section capacity. The nominal capacity of a two-section scale shall not exceed its rated section capacity^{*}. The marked nominal capacity shall not exceed the sectional capacity (SC) multiplied by the number of sections (N) of the scale minus 0.5 sections. The formula is stated as $Nominal\ Capacity = SC \times (N - 0.5)^*$.~~
*[*Nonretroactive as of January 1, 2002]*

Discussion: In 2001, paragraph S.6.4. was modified to specify that the maximum nominal capacity for railway track scales with more than two sections must not exceed twice the marked section capacity and the nominal capacity for railway track scales with two sections must not exceed the marked section capacity. The CWMA finds that the marked nominal capacity required in paragraph S.6.4. is exceeded when railcars are pushed and placed on the scale for weighing. Systems monitor and record all weighments, which includes all instances where loads exceed the marked nominal capacity (except when total platform load is in excess of 105 percent of scale capacity). The proposal permits a greater nominal capacity that is based on the section capacity multiplied by the number of sections minus 0.5 sections, which CWMA believes is consistent with the nominal capacity specifications for modular vehicle scales.

Systems Associates Inc. indicated that railway track scales are designed to meet American Railway Engineering Maintenance of Way Association and Cooper E-80 specifications as specified by the servicing railroad. System Associates Inc. indicated that modular railway track scales based on Cooper E-80 specifications can withstand loads far greater than the marked nominal capacity limits in paragraph S.6.4. The length of scales fabricated from multiple modules is restricted because of nominal capacity limitations specified in current paragraph S.6.4.

Systems Associates Inc. provided the examples below to demonstrate railway track scale loading, where railcar loads exceed nominal scale capacity limits specified in paragraph S.6.4. The modular railway track scale typically uses 100,000 lb load cells and has a 170,000 lb section capacity. A change to load cell capacity to meet the weight of coupled railcars might require modifications to the scale design and require re-evaluation by NTEP. Railcars are uncoupled at both ends to obtain a true net weight and ensure there is no coupler interaction or weight transfer. The terms used in Examples A through C that are not in Handbook 44 are defined below:

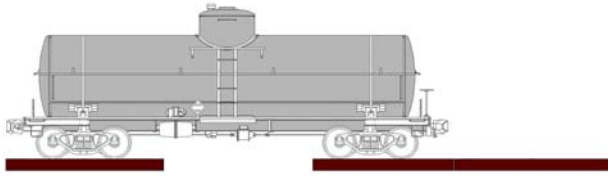
single scale – A single module having a 12 ft span that is designed to support three 80,000 lb axles on five foot centers.

double scale – A single module having a 25 ft to 26 ft span that is designed to support four 80,000 lb axles on five foot centers.

truck – swiveling framework of wheels located at each end of the railcar.

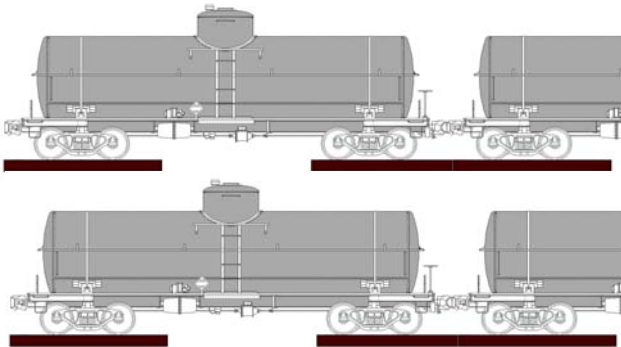
Examples of Railway Track Scale Loading

A - A Short Railcar on Single-Double scale



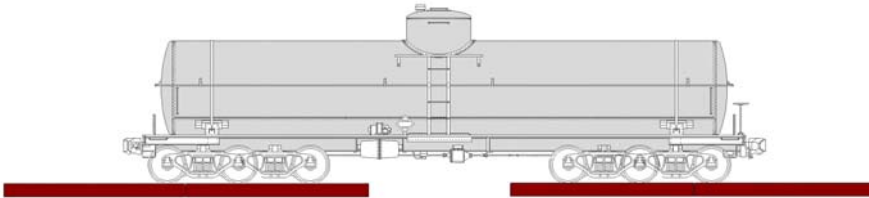
- A short railcar is spotted or placed into position for weighing on a single-double combination scale
- Each truck weighs 131,500 lb for a gross railcar weight of 263,000 lb
- The gross railcar weight does not exceed the nominal capacity of 340,000 lb

Short Railcar on a Single-Double Scale Where Weighing is NOT Intended



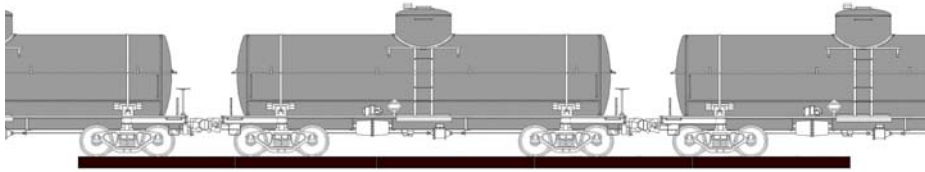
- The next car recouples to push the weighed railcar off the scale
- Each of the three trucks weighs 131,500 lb for a gross weight of 394 500 lb
- With 340 000 lb capacity, the scale is 54,500 lb overloaded under normal traffic
- The design load capacity (per railroad requirements) of this scale is 560,000 lb
- A nominal capacity of 400,000 lb would be acceptable in most applications

B - Six Axle Car on a Double-Double Scale



- Six axle railcar is spotted for weighing on a double-double combination scale
- Each truck weighs 192,000 lb for a gross weight of 384,000 lb
- With a 340 000 lb nominal capacity, this scale is overloaded by 44,000 lb
- The design load capacity of this scale (per railroad requirements) is 640,000 lb
- A nominal capacity of 600,000 lb would be acceptable in most applications

C - Railcars Moving on a 93-ft Modular Scale Where Weighing is NOT Intended



- Railcars are moving across a 93 foot scale with seven 12 foot modules
- Each truck weighs 131,500 lb for a gross weight of 526,000 lb
- With a 340 000 lb nominal capacity, this scale is overloaded by 186,000 lb
- The design load capacity of this scale (per railroad requirements) is 1,044,000 lb
- A nominal capacity of 600,000 lb would be acceptable in most applications

The Committee acknowledges that overloading of scales does occur, for example, when locomotives are driven across scales. The overloading of scales is not a problem for scales that can take the overload. NIST Handbook 44 specifies that a scale cannot indicate more than 105 percent of scale capacity. Additionally, the scale should be suitable for a particular use with respect to its design, which includes but is not limited to its weighing capacity.

The Committee made changes to the formula to align the formula with similar applications in Handbook 44 and in response to a request from the submitter. The Committee modified the formula proposal to require a nominal capacity that is less than or equal to the section capacity multiplied by the number of scale sections minus 0.5 sections. The Committee also heard that there may be instances where coupled railway cars are being statically weighed and recommends that a user requirement may be needed to resolve this enforcement issue.

During the 2003 NCWM Annual Meeting, the Committee agreed that the proposed formula permits nominal capacities that may exceed the safe load of a railway track scale. Typically, weights and measures jurisdictions do not have sufficient field test standards to test railway track scales that exceed 640,000 lb at the minimum 12.5 percent of capacity prescribed in Table 4 Minimum Test Weights and Test Loads.

The Committee included text in the title of the diagrams to clarify that the illustrations do not represent the weighing of coupled railcars. The diagrams show movement of multiple coupled railcars across scale modules to position the railcars for weighing. The scale indication may blank out since the combined weight of the coupled cars exceeds the scale's rated nominal capacity, but the indication operates when the railcars are uncoupled for the weighing of a single railcar.

The Committee recommends that the proposal needs further review by industry and the Weighing Sector to determine either a formula or language that establishes acceptable limits on the nominal capacities for railway track scales. Consequently, the Committee changed the proposal to an "information" item to allow further input on appropriate nominal capacity limitations.

2003 WWMA Recommendation:

The WWMA S&T Committee heard testimony that the American Association of Railroads (AAR) does not support the proposal as submitted. The AAR is satisfied with the language adopted by the NCWM in 2002 and is willing to work with the submitter to amend the current Handbook 44 language. The AAR also indicated that the application of the proposed formula might allow scales with capacities that exceed its structural capacities.

The WWMA recommends that this item be withdrawn.

320-3 V Appendix D; Definition of Counter Scale

Source: Carryover Item 320-4. (This item originated from the National Type Evaluation Technical Committee (NTETC) Weighing Sector and first appeared on the Committee's 2003 agenda.)

Proposal Considered: Modify the definition of "counter scale" as follows:

counter scale. ~~One-A scale that, by reason of its size, arrangement of parts, and moderate~~ with a nominal capacity no greater than 100 kg (220 lb), is adapted for use on a counter or bench. Sometimes called "bench scale."

Discussion: There are some questions as to classifying certain scales as bench/counter scales or classifying them as floor scales. This confusion has lead officials to perform different shift tests on the same device. In some instances, the shift tests were based on the requirements in NIST Handbook 44 paragraph N.1.3.1. Bench or Counter Scales, which describes test load positions for bench/counter. In other instances, paragraph N.1.3.8. All Other Scales Except Crane Scales, Hanging Scales, Hopper Scales, Wheel-Load Weighers, and Portable Axle-Load Weighers which addresses test load positions for other (platform) scales was applied to the same device model when it was classified as a floor scale.

Currently, Handbook 44 requires that bench/counter scale shift tests are conducted with a half capacity test load centered successively at four points equidistant between the center and the front, left, back and the right edges of the load-receiving element (see paragraph N.1.3.1.). Shift tests on other types of platform scales are conducted with one-half capacity test load centered, as nearly as possible, successively at the center of each quadrant (see paragraph N.1.3.8.). Several manufacturers have indicated that it is an unfair test to place one-quarter scale capacity on the corners of a single load cell scale as compared to placing one-quarter scale capacity in the corners of a scale with four load supports.

Additionally, Handbook 44 prescribes different requirements for the maximum loads that can be rezeroed in paragraph S.2.1.3. Scales Equipped with an Automatic Zero-Setting Mechanism for bench/counter scales (0.6 scale division) and for all other scales (1.0 scale division).

In October 2002, the NTETC Weighing Sector recommended a proposal to modify paragraphs N.1.3.1. and N.1.3.8. and revise the current definition of counter scale to distinguish bench/counter scale from floor scale applications based on the number of platform supports and the device's nominal capacity rating. The Weighing Sector recommended a capacity limit of 100 kg for bench/counter scales since many shipping scales in commercial use on business counters or elevated conveyors have a nominal capacity of 100 lb to 200 lb and 100 kg (220 lb) is consistent with capacity limits set by Measurement Canada.

During its October 2002 Annual Meeting, the Southern Weights and Measures Association (SWMA) agreed with limiting the capacity of a bench scale to 100 kg (220 lb); however, the SWMA did not concur with the proposed changes to paragraphs N.1.3.1. and N.1.3.8.

In April 2003, the Scale Manufacturers Association (SMA) supported a recommendation to modify the definition of "counter scale." However, the SMA could support only limited changes to paragraphs N.1.3.1. and N.1.3.8. to specify the conditions for shift tests on multiple platform supports of bench and counter scales and test loads placed on multiple points for all other scales with a single platform support.

The Committee recognizes that the Weighing Sector's proposal was intended to align the U.S. and Measurement Canada's shift test procedure that are based on the number of load supports. The Committee agreed with comments from industry and weights and measures officials that paragraphs N.1.3.1. Bench or Counter Scales and N.1.3.8. All Other Scales Except Crane Scales, Hanging Scales, Hopper Scales, Wheel-Load Weighers, and Portable Axle-Load Weighers adequately address shift test procedures and any change would create confusion. The Committee concurs with comments that the definition of counter scale needs to be modified. However, the Committee decided to amend the definition for clarity only and to include a 100 kg limit on the nominal capacity of counter scale.

During the 2003 NCWM Annual Meeting, the Committee agreed the proposal as written does not provide weights and measures officials with a means to determine the shift test procedure that is appropriate for a scale design (single or four load supports). The Committee recognizes the difficulty or reluctance of field officials to dismantling a scale to determine its design. Consequently, the Committee changed the proposals status to an information item and recommends that the Weighing Sector consider the practice of including scale design information on all NTEP Certificates of Conformance to assist officials who must perform shift tests.

2003 WWMA Recommendation:

The WWMA heard opposition to the proposal as written. The WWMA also heard several alternatives from the CWMA and NIST. Additionally, the WWMA heard testimony from scale manufacturers that language in OIML R 76 is less ambiguous and that one-third capacity shift test loads centered in the quadrant of a scale introduce the equivalent effects on a bench or counter scale as shift test loads at one-half capacity as prescribed in Handbook 44 N.1.3.1. Manufacturers state that the majority of scales are manufactured for both U.S. and international performance requirements.

The WWMA recommends that the proposal to amend the definition of bench and counter scales be withdrawn. The WWMA further recommends that the following language be added to NIST Handbook 44 to address concerns expressed by the NTETC Weighing Sector and to align Handbook 44 with OIML R76 (Non-automatic Weighing Instruments) paragraphs 4.5.7. and A.4.7.

Amend S.2.1.3. Scales Equipped with an Automatic Zero-Setting Mechanism

S.2.1.3. Scales Equipped with an Automatic Zero-Setting Mechanism (zero tracking device). - Under normal operating conditions the maximum load that can be "rezeroed," when either placed on or removed from the platform all at once, shall be:

- (a) for bench and counter scales installed prior to January 1, 200X, and livestock scales: 0.6 scale division;
- (b) for livestock scales: 0.6 scale division;
- (c) for vehicle, axle-load, and railway track scales: 3.0 scale divisions; and
- (d) for all other scales installed prior to January 1, 200X: 1.0 scale division.
- (e) for all scales other than livestock, vehicle, axle-load, and railway track scales: 0.5 scale division.
(non retroactive as of January 1, 200X)

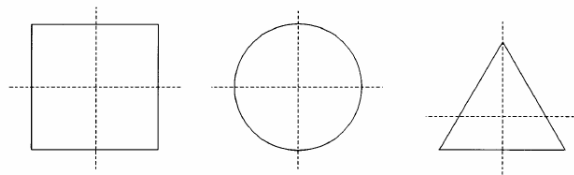
Delete N.1.3.1. Bench and Counter Scales

~~**N.1.3.1. Bench or Counter Scales.**—A shift test shall be conducted with a half-capacity test load centered successively at four points equidistant between the center and the front, left, back, and right edges of the load-receiving element.~~

Renumber remaining paragraphs.

Amend N.1.3.8.

N.1.3.78. All Other Scales Except Crane Scales, Hanging Scales, Hopper Scales, Wheel-Load Weighers, and Portable Axle-Load Weighers. - When testing a scale with a load receiving element having no more than four load supports, a shift test shall be conducted with a one-third half-capacity test load centered, as nearly as possible, successively at the center of each quarter of the load-receiving element as shown in the figures below; ~~or~~ For scales with a capacity greater than 151 kg (301 lb) and having more than one load support, a shift test may be conducted with a quarter capacity test load centered, as nearly as possible, successively over each main load support.



320-4 VC N.1.3.4.1. Weight Carts

Source: Carryover Item 320-11. (This item originated from the Northeastern Weights and Measures Association (NEWMA) and first appeared on the Committee's 2003 agenda.)

Proposal Considered: Add new paragraph N.1.3.4.1. to the Scales Code as follows:

N.1.3.4.1. Weight Carts. – Weight carts may be included as part of the minimum required test load required in N.1.3.4. provided that the mass value of the weight cart has been determined by weights and measures and is clearly marked thereon. Further, a certificate of calibration issued by the weights and measures jurisdiction that issued the weight certificate must be available at all times. Said certificate shall contain at a minimum the following information: date of calibration, name, model, and serial number of the weight cart, the minimum graduation of the scale used in the calibration of the weight cart, and the name of the jurisdiction and inspector or metrologist who determined the mass value.

Discussion: This proposal is intended to modify the NIST Handbook 44 Scales Code to recognize the use of weight carts during a shift test. Guidelines for weight carts are not recognized in any current standards document.

The Committee heard comments from the private and public sectors. The Scale Manufacturers Association supported the proposal. Several weights and measures jurisdictions indicated concern about how their weight carts will comply with requirements in the handbook, especially the fuel tank standards.

The NIST Working Group on Weight Carts conducted more in depth reviews of fuel tank requirements. The Working Group indicated its plan to define a reasonable standard that allows existing weight carts to operate. Other issues briefly discussed were the effects of weight cart uncertainties on the error limits for standards that are specified in Appendix A Fundamental Considerations Associated with the Enforcement of Handbook 44 Codes.

The Committee believes that weight cart standards developed for Handbook 44 and Handbook 105-8, "Specifications and Tolerances for Field Standard Weight Carts" should be consistent. Therefore, the Committee decided to move this developing item to an information item and awaits publication of the final Handbook 105-8.

The Committee did not receive any comments on this item possibly because the work to develop NIST Handbook 105-8 Specifications and Tolerances for Field Standard Weight Carts should near completion by October 2003. The Committee acknowledged that historically the field standard verification intervals are established by the jurisdiction.

2003 WWMA Recommendation:

The WWMA S&T Committee heard no comments on this item, and recommends no changes to the item. WWMA recommends that this move forward as a voting item at the 2004 Interim Meeting of NCWM.

322 Automatic Bulk Weighing Systems**322-1 W Tolerances**

Source: Carryover Item 322-1. This item originated from the Northeastern Weights and Measures Association (NEWMA) and first appeared on the Committee's 2002 agenda.)

Proposal Considered: Delete paragraphs T.1.4., T.2., T.2.1, T.3.2. and T.3.3.; renumber paragraphs T.3. and T.3.1.; add new paragraphs T.2.2, T.2.3., and T.2.3.1. and Table 1 and Table 2; and add a new footnote to Section 2.20 Scales Table 1.1.1. as follows:

~~**T.1.4. To Tests Involving Digital Indications or Representations. – To the tolerances that would otherwise be applied, there shall be added an amount equal to one half the value of the scale division. This does not apply to digital indications or recorded representations that have been corrected for rounding using error weights.**~~

~~**T.2. Minimum Tolerance Values. – The minimum tolerance value shall not be less than half the value of the scale division.**~~

~~T.2.1. For Systems used to Weigh Construction Materials. - The minimum maintenance and acceptance tolerance shall be 0.1 percent of the weighing capacity of the system, or the value of the scale division, whichever is less .~~

~~T.3.2. For Systems used to Weigh Grain. - The basic maintenance tolerance shall be 0.1 percent of test load.~~

~~T.3.3. For all Other Systems. - The basic maintenance tolerance shall be 0.2 percent of test load.~~

Renumber paragraphs T.3. and T.3.1. as follows:

T.3.2. Basic Tolerance Values.

T.3.2.1. Acceptance Tolerance. -The basic acceptance tolerance shall be one-half the basic maintenance tolerance but never less than 1 division.

Add new paragraphs T.2.2, T.2.3., and T.2.3.1. and Table 1 and Table 2 as follows:

T.2.2. General. - The tolerance applicable to devices not marked with an accuracy class shall have the tolerances applied as specified in Table 1. below.

Table 1. Tolerance for Unmarked Scales			
<u>Type of Device</u>	<u>Tolerance</u>	<u>Decreasing Load Multiplier</u>	<u>Other applicable Requirements</u>
<u>Grain Hoppers</u>	<u>Class III, T.2.3 (table 2)</u>	<u>1.0</u>	<u>T.2.1., T.2.3.1</u>
<u>Other Systems</u>	<u>Class III L, T.2.3 (table 2)</u>	<u>1.0</u>	<u>T.2.1., T.2.3.1</u>

T.2.3. Tolerances Applicable to Devices Marked III or III L.

T.2.3.1. Maintenance Tolerance Values - The maintenance tolerance values are specified in Table 2 below.

Table 2. Maintenance Tolerance for Marked Scales (All values in this table are in scale divisions) <u>Tolerance in scale divisions</u>				
	<u>1</u>	<u>2</u>	<u>3</u>	<u>5</u>
<u>Class</u>	<u>Test Load</u>			
<u>III</u>	<u>0 - 500</u>	<u>501 - 2000</u>	<u>2001 - 4000</u>	<u>4001 +</u>
<u>III L</u>	<u>0 - 500</u>	<u>501 - 1000</u>	<u>(Add 1d for each additional 500 d or fraction thereof)</u>	

Add a new footnote to Section 2.20 Scales Code Table 1.1.1. Tolerances for Unmarked Scales as follows:

^x**Automatic bulk weighing systems see Section 2.22 for specifications and tolerances.**

Discussion: NEWMA recommended changing the prescribed tolerances for automatic bulk weighing systems from a percentage basis to division values which are based on the device's accuracy class. NEWMA believes this change will align tolerances in the Automatic Bulk Weighing Systems (ABWS) Code and Scales Code. Additionally, NEWMA believes a footnote should be added to the Scales Code Table T.1.1. to avoid any confusion about devices that can be classified as automatic bulk weighing systems.

The Committee recognized there is confusion over which weighing systems fall under the Automatic Bulk Weighing Systems Code. During the 2002 July NCWM Annual Meeting, the Committee encouraged the Technical Advisors to develop materials on automatic bulk weighing systems in time for presentations at the 2002 fall regional weights and measures association meetings. Consequently, the Committee kept this an information item.

During the its September 2002 Technical Conference, the Western Weights and Measures Association agreed with the USDA Grain Inspection Packers and Stockyard Administration (GIPSA) concerns about the proposed tolerances permitting additional inaccuracies in automatic bulk weighing systems. Consequently, the WWMA recommended the NCWM S&T Committee withdraw this item from the agenda.

NEWMA reports that New York supports returning the item to voting status. New York believes the changes to the tolerances are necessary to align the code with other scale codes. New York provided GIPSA with charts and tables to demonstrate that the proposed tolerances, based on scale divisions, only minimally change the current tolerances. The charts were available at the 2003 NCWM Interim Meeting.

The Committee acknowledges there is still confusion about which code applies to hopper scales such as systems used in grain and asphalt applications. The Committee notes that adding a controller to a hopper or a hopper that makes a limited number of drafts (continuous) cannot be classified as an automatic bulk weighing system. Typically, an ABWS must record a load and no load for each successive draft.

The Committee made the proposal an information item to allow GIPSA and New York sufficient time to work through accuracy class and percentage based tolerance data. GIPSA indicated there is a problem with the proposal because it represents a tolerance based on accuracy class which results in a substantial cumulative error. New York stated the benefits to an accuracy class tolerance go beyond harmonizing the requirements in the ABWS and Scales Codes. One option discussed to resolve GIPSA's concerns about the impact of the proposed tolerances on weighing operations where GIPSA has oversight is to create an exemption for all grain scales similar to what exist in the Scales Code.

The Committee encourages New York's Bureau of Weights and Measures and USDA GIPSA to continue their work to develop a set of tolerances that is mutually agreeable and appropriate for automatic bulk weighing systems.

For more background information, refer to the 2002 and 2003 (pending publication) S&T Final Report.

2003 WWMA Recommendation:

The WWMA heard no comments on this item. The WWMA remains concerned about the potential cumulative effect presented by allowable errors in the proposed step tolerances.

The WWMA continues to recommend that this item be withdrawn.

324 Automatic Weighing Systems Code – Tentative Code

324-1 I Tentative Status of the Automatic Weighing Systems Code

Source: Carryover Item 324-1. (This item originated from the Southern Weights and Measures Association (SWMA) and first appeared on the Committee's 2002 agenda.)

Proposal Considered: Change the status of the Automatic Weighing Systems Code from tentative to permanent.

Discussion: The Automatic Weighing Systems Code was added to the 1996 edition of NIST Handbook 44 as a Tentative Code. In 2002, the adoption of the code as a permanent code in Handbook 44 was delayed to resolve issues with several NTEP test criteria which are based on code requirements. On October 2-3, 2002, in Annapolis, Maryland, a work group met to review any remaining code issues. The Work Group discussed Handbook 44 requirements that limit a device to operating in a single unit of measure. The Work Group questioned the need for NTEP laboratories to perform line frequency and barometric pressure test. The Work Group noted that there are inconsistencies in the titles of several requirements. Manufacturers indicated great concern because devices that meet Handbook 44 tolerances are producing packages that do not comply with NIST Handbook 130 requirements.

The Committee recognizes that the entire AWS Work Group has not had the opportunity to review and comment on a first draft of changes to the AWS Code. The Committee also heard that one member of the AWS Group plans to submit changes to the draft. Therefore, the Committee made the proposal an information item.

During its 2003 NCWM Annual Meeting Open Hearing session, the Committee was notified the final comments for the Work Group are available in electronic format. The Committee anticipates that the work on any remaining issues with the Automatic Weight Systems Code will conclude shortly and that any recommendations to modify Handbook 44 will be shared with the Weighing Sector and regional weights and measures associations prior to their meeting in the fall of 2003.

For more background information, refer to the 2002 and 2003 (pending publication) S&T Final Report.

2003 WWMA Recommendation:

The WWMA heard comments from manufacturers that continue to oppose changing the current status of the tentative code because of allowable device errors permitted in Handbook 44 that may present inconsistencies with package lot requirements in Handbooks 130 and 133; the utilization of a scale, for packaging, that meets allowable device tolerances may produce package lots that do not meet allowable variance restrictions under Handbook 133. The manufacturers recommended further development by the Automatic Systems Work Group to resolve the remaining issues. The WWMA S&T considered a proposal to amend the application of the AWS code exclusively to automatic weigh-labelers used in USDA facilities and concluded that this proposed solution would not eliminate the concerns with packages checked at the point-of-pack.

The WWMA recommends that this item remain informational.

330 Liquid Measuring Devices

330-1 I S.2.1. Multiple Measuring Elements With a Single Provision for Sealing

Source: Carryover Item 330-1. (This item originated from the National Type Evaluation Technical Committee Measuring Sector and first appeared on the Committee's 2003 agenda.)

Proposal Considered: Add new paragraph to NIST Handbook 44, Section 3.30. Liquid-Measuring Devices S.2.2.1. Multiple Measuring Elements with a Single Provision for Sealing as follows:

S.2.2.1. Multiple Measuring Elements with a Single Provision for Sealing. - A change to the adjustment of any measuring element within any multi-product dispenser with a single provision for sealing multiple measuring elements must be identified.

Background/Discussion: At the June 2002 NTEP Laboratory Meeting, one of the participating laboratories indicated that field officials in their jurisdiction are having difficulty with multi-product dispensers that have only one sealing mechanism for two or more measuring elements. If a field official rejects a meter for not meeting performance requirements, they have no way of determining which measuring elements have been recalibrated when they return to reinspect the dispenser after a service agency has made adjustments or repairs on the rejected device. During the performance of a subsequent inspection following adjustment or repair of the device, the field official may be required to test all grades and blends offered through the rejected dispenser to determine that only the correct measuring element was adjusted.

At its October 2002 meeting, the NTETC Measuring Sector developed a proposal to address the concern with retail motor-fuel dispensers that have only one sealing mechanism that provides the adjustment security for multiple measuring elements. The Sector agreed to forward the proposal to the S&T Committee for consideration.

At its October 2002 Annual Meeting, the SWMA recommended that the proposal to add a new paragraph to NIST Handbook 44, Section 3.30. Liquid-Measuring Devices paragraph S.2.2.1. be forwarded to the NCWM S&T Committee as an information item.

At the 2003 NCWM Interim Meeting, the Committee heard support for identifying, in a manner that is readily available to the field official, any measuring element that is adjusted and agreed that the item has merit. Device manufacturers present at the meeting stated that identifying any measuring element that is adjusted is possible on dispensers that have only one sealing mechanism for two or more measuring elements. The manufacturers requested time to develop an appropriate mechanism for providing that information. The Committee gave the item informational status to provide device manufacturers the opportunity to study the issue and develop means for meeting the proposed requirements.

2003 WWMA Recommendation:

The WWMA heard comments that the National Type Evaluation Technical Committee (NTETC) Measuring Sector will review this item at their October 2003 meeting. The WWMA is concerned that the integrity of all adjustments protected by the security means is lost when a physical security seal is removed, replaced, broken, or damaged.

The WWMA recommends this item remain informational until the NTETC Measuring Sector has addressed the concerns of the WWMA in its recommendation to the NCWM S&T Committee.

330-2 I UR.2.5. Product Identification

Source: Carryover Item 330-4. (This item originated from the National Type Evaluation Technical Committee Measuring Sector and first appeared on the Committee's 2003 agenda.)

Proposal Considered: Modify NIST Handbook 44, Section 3.30. Liquid-Measuring Devices UR.2.5. as follows:

UR.2.5. Product Storage Identification.**UR.2.5.1. Measuring Element Identification.**

- (a) The measuring elements of any multi-product dispenser shall be permanently, plainly, and visibly identified as to product being measured.**
 - (b) When the measuring elements of any multi-product dispenser are marked by means of a color code, the color code key shall be conspicuously displayed at the place of business and be consistent with the color code used for product storage.**
- (Added 200X)**

UR.2.5.2. Product Storage Identification.

- (a) The fill connection for any petroleum product storage tank or vessel supplying motor-fuel devices shall be permanently, plainly, and visibly marked as to product contained.**
 - (b) When the fill connection device is marked by means of a color code, the color code key shall be conspicuously displayed at the place of business.**
- (Added 1975 and Amended 1976 and renumbered 200X)**

Background/Discussion: At the June 2002 NTEP Laboratory Meeting, one of the participating laboratories indicated that field officials in their jurisdiction are sometimes not able to determine which measuring element is associated with a particular grade or blend of fuel on multi-product dispensers. During a field examination of a multi-product dispenser if one grade or blend is rejected for not meeting performance requirements, the official does not know which measuring element to mark or tag as rejected. During the performance of a subsequent inspection following adjustment or repair of the device, the field official may be required to test all grades and blends offered through the rejected dispenser to determine that only the correct measuring element was adjusted.

At its October 2002 meeting, the NTETC Measuring Sector developed a proposal that requires a measuring element without an individual physical seal within any multi-product dispenser be plainly and visibly identified as to the product being measured. The Sector agreed to forward the proposal to the S&T Committee through the SWMA.

At its October 2002 Annual Meeting, the SWMA recommended that the proposed modification to NIST Handbook 44, Section 3.30. Liquid-Measuring Devices paragraph UR.2.5. be forwarded to the NCWM S&T Committee as a voting item.

At the 2003 NCWM Interim Meeting, the Committee heard support for identifying the product that any individual measuring element, of a dispenser with multiple measuring elements, is measuring. The device manufacturers present at the meeting

agreed that this requirement would also assist service agencies making adjustments to a dispenser when the measuring element for only a certain product needs adjustment. The device manufacturers also agreed that, for devices currently in the market place, a user can readily identify the product that any individual measuring element, of a dispenser with multiple measuring elements, is measuring.

During the 2003 NCWM Annual Meeting, the Committee agreed that if a color code is used for identifying measuring elements and product storage fill connections they should be the same. The Committee returned the proposal to the Measuring Sector to rework to include language to clarify that the requirement is intended to apply to equipment that has no moving mechanical parts.

2003 WWMA Recommendation:

The WWMA heard comments that the National Type Evaluation Technical Committee (NTETC) Measuring Sector will review this item at their October 2003 meeting.

The WWMA supports the concept of this proposal and recommends this item remain informational until the NTETC Measuring Sector has made its recommendation to the NCWM S&T Committee.

330-3 V Appendix D; Definition of Retail Device

Source: Carryover Item 330-6. (This item originated from the Western Weights and Measures Association (WWMA) and first appeared on the Committee's 1999 agenda.)

Proposal Considered: Modify the definition of retail devices as follows:

retail device. A device primarily used for non-resale use.

~~single deliveries of less than 378 L (100 gal),~~

~~retail deliveries of motor fuels to individual highway vehicles, or~~

~~single deliveries of liquefied petroleum gas for domestic use and liquefied petroleum gas or liquefied anhydrous ammonia for nonresale use.~~

~~[3.30, 3.31, 3.32, 3.37]~~

Background/Discussion: During the 2001 NCWM Annual Meeting, the Committee considered several proposals that define retail devices as those that deliver product to the final user. The Committee agreed that these proposals change the classification of some devices, previously classified as wholesale devices, to retail devices that are held to a lesser tolerance.

At the 2002 NCWM Interim Meeting, the Committee agreed that if Items 330-3A, 330-3B, and 331-3 were adopted, changes to the definition would be unnecessary and this item could be withdrawn from its agenda.

At the 2002 NCWM Annual Meeting, no comments were received on this item. Items 330-3A and 331-3 were adopted. Item 330-3B was carried over as informational to provide the regional associations the opportunity to identify and discuss any negative impact it would have on the affected codes in NIST Handbook 44.

At its September 2002 Interim Meeting, the Central Weights and Measures Association agreed that the word "primarily" is ambiguous and should be removed from the proposal.

At its September 2002 Annual Meeting, the Western Weights and Measures Association supported the item as proposed.

At its October 2002 Interim Meeting, the Northeastern Weights and Measures Association agreed that this item is unnecessary if accuracy classes are adopted for Section 3.32. through Section 3.36. and Section 3.38.

At the 2003 NCWM Interim Meeting, the Committee heard that even with the adoption of the accuracy class tables last year, a definition of “retail device” is still needed because the term “retail” is referenced in several paragraphs in the Liquid-Measuring Devices code and in other measuring device codes of NIST Handbook 44. The Committee believes that the term “primarily” in the retail device definition is appropriate to provide weights and measures officials some flexibility for determining the applicability of various requirements on a case-by-case basis. The Committee agreed that the item should remain informational to allow further study of all the codes potentially affected by the change.

For more background information, refer to the 1999 through 2003 (pending publication) S&T Final Reports.

2003 WWMA Recommendation:

The WWMA S&T reviewed all references to “retail” in Handbook 44 3.30 Liquid-Measuring Devices and 3.32 Liquefied Petroleum and Anhydrous Gas codes. WWMA recommends the following alternate language for the definition of “retail devices,” and incorporates the terms “retail motor-fuel devices” and “retail motor-fuel dispensers,” which are used similarly in existing code. The Committee believes that the following definition addresses the intent of the referenced codes.

Retail devices (retail motor-fuel devices, retail motor-fuel dispensers). A liquid measuring device utilized at any time to measure product for purpose of sale to the end user.[3.30 and 3.32]

331 Vehicle-Tank Meters

331-1 VC Recognition of Temperature Compensation

Source: Carryover Item 331-1 (This item originated from the Western Weights and Measures Association (WWMA) and first appeared on the Committee’s 2000 agenda.)

Proposal Considered: Modify NIST Handbook 44, Section 3.31. Vehicle-Tank Meters Code (VTM) by adding the following paragraphs to recognize temperature compensation as follows:

S.2.4. Automatic Temperature Compensation for Refined Petroleum Products.

S.2.4.1. Automatic Temperature Compensation for Refined Petroleum Products. - A device may be equipped with an automatic means for adjusting the indication and registration of the measured volume of product to the volume at 15 °C (60 °F), where not prohibited by State Law.

S.2.4.2. Provision for Deactivating. - On a device equipped with an automatic temperature-compensating mechanism that will indicate or record only in terms of liters (gallons) compensated to 15 °C (60 °F), provision shall be made for deactivating the automatic temperature-compensating mechanism so that the meter can indicate and record, if it is equipped to record, in terms of the uncompensated volume.

S.2.4.2.X. Gross and Net Indications – A device equipped with automatic temperature compensation shall indicate and record, if equipped to record, both the gross (uncompensated) and net (compensated) volume for testing purposes. If both values cannot be displayed or recorded for the same test draft, means shall be provided to select either the gross or net indication for each test draft.

S.2.4.3. Provision for Sealing Automatic Temperature Compensating Systems. – Adequate provision shall be made for an approved means of security (e.g., data change audit trail) or physically applying security seals in such a manner that an automatic temperature-compensating system cannot be disconnected and that no adjustment may be made to the system.

S.2.4.4. Temperature Determination with Automatic Temperature Compensation. - For test purposes, means shall be provided (e.g., thermometer well) to determine the temperature of the liquid either:

(a) in the liquid chamber of the meter, or

(b) immediately adjacent to the meter in the meter inlet or discharge line.

S.5.6. Temperature Compensation for Refined Petroleum Products. - If a device is equipped with an automatic temperature compensator, the primary indicating elements, recording elements, and recording representation shall be clearly and conspicuously marked to show that the volume delivered has been adjusted to the volume at 15 °C (60 °F).

N.4.1.3. Automatic Temperature Compensating Systems for Refined Petroleum Products. - On devices equipped with automatic temperature-compensating systems, normal tests shall be conducted:

by comparing the compensated volume indicated or recorded to the actual delivered volume corrected to 15 °C (60 °F); and

with the temperature-compensating system deactivated, comparing the uncompensated volume indicated or recorded to the actual delivered volume.

The first test shall be performed with the automatic temperature-compensating system operating in the "as found" condition. On devices that indicate or record both the compensated and uncompensated volume for each delivery, the tests in (a) and (b) may be performed as a single test.

N.5. Temperature Correction for Refined Petroleum Products. - Corrections shall be made for any changes in volume resulting from the differences in liquid temperatures between the time of passage through the meter and time of volumetric determination in the prover. When adjustments are necessary, appropriate petroleum measurement tables should be used.

T.2.1. Automatic Temperature-Compensating Systems. - The difference between the meter error (expressed as a percentage) for results determined with and without the automatic temperature-compensating system activated shall not exceed:

(a) 0.4 percent for mechanical automatic temperature-compensating systems; and

(b) 0.2 percent for electronic automatic temperature-compensating systems.

The delivered quantities for each test shall be approximately the same size. The results of each test shall be within the applicable acceptance or maintenance tolerance.

UR.2.5. Temperature Compensation for Refined Petroleum Products.

UR.2.5.1. Automatic.

UR.2.5.1.1. When to be Used. - In a State that does not prohibit, by law or regulation, the sale of temperature-compensated product a device equipped with an operable automatic temperature compensator shall be connected, operable, and in use at all times. An electronic or mechanical automatic temperature compensating system may not be removed, nor may a compensated device be replaced with an uncompensated device, without the written approval of the responsible weights and measures jurisdiction.

[Note: This requirement does not specify the method of sale for product measured through a meter.]

UR.2.5.1.2. Invoices.

(a) An invoice based on a reading of a device that is equipped with an automatic temperature compensator shall show that the volume delivered has been adjusted to the volume at 15 °C (60 °F).

Discussion/Background: When this item was submitted, weights and measures officials indicated confusion about the specific meter applications that are covered by an NTEP Certificate of Conformance for a meter that includes the temperature-compensation feature. The WWMA acknowledged that there are jurisdictions that permit temperature compensated deliveries in applications that are not addressed by NIST Handbook 44. Other states do not allow the use of automatic temperature compensation for the delivery of products using a vehicle-tank meter.

At the 2002 NCWM Interim and Annual Meeting, the Committee also heard several comments supporting the item because the language does not require the use of temperature compensation, but does provide requirements and inspection aids for those jurisdictions that have temperature compensated vehicle-tank meters in use. The item provides specifications, tolerances, test notes, and user requirements if a temperature compensated device is used. The Committee did hear some opposition to the proposal from officials who believe they would be forced to accept temperature compensated vehicle-tank meters because there is not a specific prohibition in their weights and measures law; however, the Committee concluded that the opposition was not supported by a technical argument and there are other means for prohibiting the use of temperature compensated vehicle-tank meters in any particular state. The Committee agreed to present the item for a vote at the 2002 NCWM Annual Meeting.

At the 2002 NCWM Annual Meeting, this item neither passed nor failed; therefore, it was returned to the Committee for further consideration.

At its September 2002 Interim Meeting, the Central Weights and Measures Association reaffirmed its recommendation that the L&R Committee adopt appropriate language for a method of sale requirement for temperature compensated vehicle-tank meters to promote uniformity.

At its September 2002 Annual Meeting, the WWMA supported this item as proposed and recommended that the NCWM S&T Committee move it forward as a voting item.

At its October 2002 Interim Meeting, the Northeastern Weights and Measures Association recommended that the NCWM S&T Committee move this item forward as a voting item.

At the 2003 NCWM Interim Meeting, the Committee heard both support and opposition to this item for similar reasons expressed at earlier meetings. The Meter Manufacturers Association (MMA) indicated that the proposed tolerances in paragraph T.2.1. of 0.2 percent for mechanical automatic temperature-compensating systems and 0.1 percent for electronic automatic temperature-compensating systems were too restrictive and should be changed to 0.4 percent for mechanical systems and 0.2 percent for electronic systems. The Committee agreed with the MMA and modified T.2.1., accordingly. The Committee agreed to present the item for a vote at the 2003 NCWM Annual Meeting as shown above.

At the 2003 NCWM Annual Meeting, this item neither passed nor failed; therefore, it was returned to the Committee for further consideration.

For additional background on this item see the NCWM 2000 through 2003 (pending publication) S&T Final Reports.

2003 WWMA Recommendation:

At its September 2003 Annual Meeting, the Committee heard comments of support for this item.

The WWMA continues its strong support of this item, as proposed. WWMA recommends that the NCWM S&T Committee move the proposal forward as a voting item.

331-2 I N.4.2. Special Tests (Except Milk-Measuring Systems); N.4.5. Product Depletion Test; T.5. Product Depletion Test

Source: Carryover Item 331-6. (This item originated from the Northeastern Weights and Measures Association (NEWMA) and first appeared on the Committee's 2003 agenda.)

Proposal Considered: Modify NIST Handbook 44, Section 3.32. Vehicle-Tank Meters paragraph N.4.2. Special Tests (Except Milk-Measuring Systems) as follows:

N.4.2. Special Tests (Except Milk-Measuring Systems). “Special” tests shall be made to develop the operating characteristics of a measuring system and any special elements and accessories attached to or associated with the device. Any test except as set forth in N.4.1. or N.4.5. shall be considered a special test. Special test of a measuring system shall be made as follows:

- (a) at a minimum discharge rate of 20 percent of the marked maximum discharge rate or at the minimum discharge rate marked on the device whichever is less;
- (b) to develop operating characteristics of the measuring system ~~during a split-compartment delivery.~~

Add new paragraphs N.4.5. Product Depletion Test and T.5. Product Depletion Test to the Vehicle-Tank Meters Code as follows:

N.4.5. Product Depletion Test. – The effectiveness of the vapor eliminator shall be tested by depleting the product supply and continuing until the lack of fluid causes the meter register to stop completely. The test shall be completed by switching to another compartment with sufficient product on a multi-compartment vehicle, or by adding sufficient product to a single compartment vehicle. When adding product to a single compartment vehicle, allow appropriate time for any entrapped vapor to disperse before continuing the test.

T.5. Product Depletion Test. – The difference in the delivered volumes for the normal test and the product depletion test shall not exceed 0.5 percent of the equivalent of one minute of flow at the maximum rated flow rate for the system.

Discussion: The proposal intends to recognize that the vapor measured when product is depleted during the vehicle-tank meter split compartment test (product depletion test) is a system problem that is not related to the prover size. The proposal requires a split compartment test (product depletion test) for single compartment vehicles to verify the performance of the air elimination mechanism.

At the 2003 NCWM Interim Meeting, the Committee agreed that the proposal has merit because the product depletion test is necessary for vehicle-tank meters and the proposal provides guidelines on the appropriate test conditions. Therefore, the Committee changed the status of this item from “developing” to an “information” item. The proposal is based on the flow rate rather than the size of the prover and the tolerance remains the same regardless of the size of the prover. NEWMA noted concerns because operators with vehicle-tank meters that fail tests completed with 100-gallon provers are passing tests in neighboring jurisdictions that use larger prover/standards (i.e., 200-gallon).

The Committee is uncertain that all sizes of vehicle-tank meters can attain the 0.5 percent tolerance proposed for the difference in the test results between the normal and product depletion tests. The Committee asks for data that demonstrates the ability of vehicle-tank meters to meet the proposed tolerance. The Committee also recommends NEWMA consult with Measurement Canada on its test procedures and develop guidelines for switching tanks when all tanks are not the same size to ensure an adequate test of the vehicle-tank meters since tanks of different sizes drain at different rates.

To provide input on this proposal contact Ross Andersen (New York Bureau of Weights and Measures) by telephone at 518-457-3146, by fax at 518-457-5693, or by email at ross.andersen@agmkt.state.ny.us or Stephen Martin (New York Bureau of Weights and Measures) by telephone at 315-487-2250, by fax at 315-487-2408, or by email at weighsyr@agmkt.state.ny.us.

2003 WWMA Recommendation:

The WWMA heard no comments on this item. The WWMA is concerned that the proposed tolerance for product depletion tests would allow errors exceeding current applicable tolerances. Additionally, the WWMA agrees with the NCWM S&T Committee that data is needed to demonstrate that VTM can attain the proposed tolerances.

The WWMA recommends that the item remain informational pending further development by New York and the NTETC Measuring Sector.

332 **LPG and Anhydrous Ammonia Liquid-Measuring Devices**

332-1 **W UR.2.3. Vapor-Return Line**

Source: Carryover Item 332-2. (This item was developed by the Southern Weights and Measures Association (SWMA) and first appeared on the Committee's 2002 agenda.)

Proposal Considered: Modify NIST Handbook 44, Section 3.32. LPG and Anhydrous Ammonia Liquid-Measuring Devices paragraph UR.2.3. as follows:

UR.2.3. Vapor Return Line – During any metered delivery of liquefied petroleum gas from a supplier's tank to a receiving container, there shall be no vapor-return line from the receiving container to the supplier tank except:

(a) in the case of any receiving container to which normal deliveries cannot be made without the use of such vapor-return line, or

(b) in the case of any new receiving container when the ambient temperature is below above 90 °F, or

(c) in the case of wholesale terminal deliveries.

Background/Discussion: At its September 2001 Annual Meeting, the SWMA heard a concern from Tennessee that vapor-return lines are commonly used at LPG loading rack terminals where large capacity transports are loaded for distribution to bulk LPG dealers. At least some of the companies operating terminals are applying industry-derived factors that are used to credit customers for metered product that is returned as vapor to the sellers' storage tanks. Paragraph U.R.2.3. (a) provides an exception for abnormal conditions, such as high pressure in the receiving tank, which prevents delivery without the use of a vapor return line. The SWMA questions whether or not bulk terminal locations fall under this exemption. The terminals where vapor-return lines are being used have insufficient pumping ability to fill the large vessels that are used to distribute LPG to bulk dealer facilities; however, when pumping capacity becomes an issue, the condition can be remedied by installing new pumping and metering equipment which is capable of filling the large pressure vessels without a vapor-return line. Additionally, the terminals have the option of weighing the product rather than metering it. These conditions exist at LPG terminals in all regions of the United States, thus, this is not a unique situation only affecting the State of Tennessee.

SWMA agreed with Tennessee that the following points should be reviewed to remove any ambiguity about the appropriateness of vapor return lines in various LPG filling operations:

- Allow loading rack terminals to use vapor-return lines and review a proposal from industry on applying the vapor factor to credit the purchaser. A mean credit value may be adequate, although it has been determined that the vapor returned is not always consistent from delivery to delivery.
- Allow a vapor meter to be installed between the receiving vessel and the seller's tanks, then convert the vapor measurements to liquid quantities and credit the purchaser.
- Provide a consensus opinion that bulk terminal loading-rack installations meet the exception contained in paragraph UR.2.3. (a) and no action is needed by weights and measures officials.
- Provide a consensus opinion that the conditions do not meet the exception noted in paragraph UR.2.3. and weights and measures official should require terminals currently unable to load without vapor-return lines to take corrective action to comply with NIST Handbook 44.

The SWMA recognized the concerns of the State of Tennessee and agreed to forward this item to NCWM, but recommends it remain informational to allow time for the submitter to develop specific language.

Following the 2003 NCWM Interim Meeting, the Committee received the proposal shown in the recommendation above from the State of Tennessee. The Committee agreed the item should remain informational to provide the regional associations an opportunity to review and discuss Tennessee's proposal.

For clarity the Committee agreed modify the proposal and make the last sentence in the original proposal a separate paragraph (c) as shown in the recommendation above.

2003 WWMA Recommendation:

The WWMA heard no comments on this item. The WWMA S&T Committee is concerned that the proposal does not include a means for compensating for returned product in a vapor state. The WWMA agrees with the last bulleted suggestion of the Southern Weights and Measures Association that weights and measures officials should require terminals currently unable to load without vapor-return lines to take corrective action to comply with NIST Handbook 44.

The WWMA recommends that this item be withdrawn.

358 Multiple Dimension Measuring Devices**358-1 I Tentative Status of the Multiple Dimension Measuring Devices Code**

Source: Carryover Item 358-1. (This item originated from the Southern Weights and Measures Association (SWMA) and first appeared on the Committee's 2002 agenda.)

Proposal Considered: Change status of the Multiple Dimension Measuring Devices Code (MDMD) from tentative to permanent.

Discussion: In response to comments from weights and measures officials and industry representatives the Multiple Dimension Measuring Devices Code was considered in 2002 for permanent status. The Committee heard that the code should be harmonized with the more stringent Canadian requirements. Industry representatives cautioned that other issues may exist because the code was developed prior to some of the latest electronic technology. Therefore, in July 2002, the proposal was changed from a "voting" item to an "information" item pending further review.

The Northeastern and Western Weights and Measures Associations recommended the proposal remain an "information" item until a work group can review the code requirements.

During the 2003 NCWM Interim Meeting, the Committee heard that there remain a number of proposals to modify Canadian requirements for MDMD devices. Consequently, in the interest of aligning U.S. and Canadian requirements, the Committee made the proposal an "information" item to allow time for review and comparison of U.S. and pending Canadian requirements.

The Multiple Dimension Measuring Devices (MDMD) Work Group met July 17-18, 2003 to discuss outstanding issues in the MDMD Code. The Work Group plans to submit proposals for changes to NIST Handbook 44 by the January 2004 NCWM Interim Meeting.

For more background information, refer to the 2002 and 2003 (pending publication) S&T Final Report.

2003 WWMA Recommendation:

The WWMA heard comments that the "tentative" status of the MDMD code should not be upgraded to "permanent" status until the six items submitted by the MDMD Working Group at their last meeting in July 2003 have been adopted.

The WWMA agrees with the above comments and recommends that this item be adopted by the NCWM in conjunction with adoption of WWMA S&T 21 through 26.

360 Other Items**360-1 I Revise NIST Handbook 44**

Source: Carryover Item 360-1 (This item originated from the Southern Weights and Measures Association (SWMA) and first appeared on the Committee's 1999 agenda.)

Discussion: The Committee is not aware of any updates on the work to revise NIST Handbook 44. The Committee recommends that all parties interested in the status of this project contact the NCWM Board of Directors (BOD).

At its 2002 Interim Meeting, members of the Northeastern and Western Weights and Measures Associations agreed to continue to support the BOD's effort and encourage the BOD to fund this project.

The Committee also encourages the NCWM Board of Directors (BOD) to continue to provide financial support for the project. The Committee believes that the project to revise Handbook 44 is worthwhile and needed by Handbook 44 users.

The Committee believes that Handbook 44 is a most important tool for the weight and measures community. The Committee agreed that work should continue to reformat the document to make it more user-friendly. The Committee encourages the BOD to continue in its support of the project to revise Handbook 44.

2003 WWMA Recommendation:

WWMA recommends that this item remain informational and encourages the NCWM BOD to support the revision project.

360-2 I International Organization of Legal Metrology (OIML) Report

The OIML Report is included as part of the NCWM OIML Board of Director's 2004 Interim Agenda Item TBD.

Many issues before the OIML, the Asian-Pacific Legal Metrology Forum (APLMF), and other international activities are within the purview of the S&T Committee. Additional information on OIML activities is available on the OIML web site at <http://www.oiml.org/>.

For more information on weighing devices, contact Steven Cook (NIST Weights and Measures Division Legal Metrology Devices Group (WMD-LMD)) by telephone at 301-975-4003 or by e-mail at steven.cook@nist.gov. For more information on grain moisture meters, contact Diane Lee (WMD-LMD) by telephone at 301-975-4405 or by e-mail at diane.lee@nist.gov. For more information on taximeters, contact Juana Williams (WMD-LMD) by telephone at 301-975-3989 or by e-mail at juana.williams@nist.gov. For more information on the R 117, Measuring Systems for Liquids Other than Water and R 105, Direct Mass Flow Measuring Systems for Quantities of Liquids, and gas meters, contact Ralph Richter (WMD-International Legal Metrology Group (WMD-ILM)) by telephone at 301-975-4025 or by e-mail at ralph.richter@nist.gov. For information on measuring devices, contact Wayne Stiefel (WMD-ILM) by telephone at 301-975-4011, or by e-mail at s.stiefel@nist.gov. For more information on electronic measuring devices, contact Dr. Ambler Thompson (WMD-ILM) by telephone at 301-975-2333 or by e-mail at ambler@nist.gov. Mr. Cook, Ms. Lee, and Ms. Williams can also be reached by postal mail at NIST, 100 Bureau Drive-STOP 2600, Gaithersburg, MD 20899-2600 or by fax at 301-926-0647. Mr. Richter, Mr. Stiefel, and Dr. Thompson can also be reached by postal mail at NIST, 100 Bureau Drive-STOP 2600, Gaithersburg, MD 20899-2600 or by fax at 301-975-5414.

The NIST WMD contracted with Mr. John Elengo (Consultant) to create a line item comparison document and analysis of requirements in NIST Handbook 44 Scale Code and OIML Recommendations R 76, "Non-Automatic Weighing Instruments," and R 60 "Metrological Regulations for Load Cells." To obtain a copy of the document, access the WMD web site at www.nist.gov/owm. The work represents the first stages to harmonize U.S. and international requirements for non-automatic weighing systems and load cells. The Committee encourages comments on the draft document that compare R 76 and R 60 with corresponding requirements in NIST Handbook 44 Scales Code.

2003 WWMA Recommendation:

Steve Cook, NIST WMD, informed the WWMA that its members should contact NIST/WMD if they are interested in becoming members of the U.S. National Work Groups on the various international activities of the WMD International Legal Metrology Group. WWMA recommends that this item remain informational.

WWMA S&T COMMITTEE
New Proposals

310 Series – General Code**WWMA S&T-1 D**

CONTACT PERSON: Gary Castro

JURISDICTION: California

PROPOSAL CONSIDERED: Amend G-S.5.6.1. Recorded Representations, as follows, and expand Table 1. Representation of Units to include additional units of measure.

~~G-S.5.6.1. Recorded Representation of Metric Units on Equipment with Limited Character Sets~~ Acceptable Abbreviations for Recorded and Indicated Representation of Units on Equipment. - The appropriate defining symbols are shown in Table 1.

(Added 1997) (Amended 200X)

Add the following abbreviations to Table 1:

Name of Unit	Common Use Symbol	Representation			Name of Unit	Common Use Symbol	Representation		
		Form I	Form II				Form I	Form II	
		(double case)	(single lower case)	(single case upper)			(double case)	(single lower case)	(single case upper)
inches	in	In	in	IN	deciliter	dL	dL		
foot	ft	ft	ft	FT	kiloliter	kL	kL		
yard	yd	yd	yd	YD	cubic meter	M ³	m ³	m ³	M ³
milligram	mg	mg	mg		cubic inches	in ³	in ³	in ³	IN ³
megagram	Mg	Mg			cubic foot	ft ³	ft ³	ft ³	FT ³
grain	gr	gr	gr		cubic yard	yd ³	yd ³	yd ³	YD ³
dram	dr	dr	dr		gills	gi	gi	Gi	GI
ounce	oz	oz	oz	OZ	pint	pt	pt	pt	PT
pound	lb	lb	lb	LB	quart	qt	qt	qt	QT
hundredweight	cwt	cwt	cwt	CWT	gallon	gal	gal	gal	GAL
pennyweight	dwt	dwt	dwt	DWT	ampere	A, I	A, I		A, I
ounce troy	oz t	oz t	oz t	OZ T	resistance	ohms	ohms	ohms	OHMS
milliliters	mL	mL							
centiliter	cL	cL							

JUSTIFICATION: Currently, Table 1 does not list many units that are in common use today.

REASONS FOR: Today, weighing and measuring device manufacturers are able to develop equipment that print common and uncommon units of measure. Currently, the only list of acceptable abbreviations in Handbook 44 is found in Table 1 of the General Code. The table does not list abbreviations for units such as, gallons, inches, ounces and tons. During an evaluation this makes determining what is an acceptable abbreviation for these units difficult. Additionally, it does not promote uniformity. A list of acceptable units will alleviate this problem for industry and weights and measures inspectors

2003 WWMA Recommendation:

The WWMA S&T Committee heard comments in support of additions to Table 1. Representation of Units, but that additional abbreviations should be added to address other units in common usage.

The WWMA recommends that this item be given “developmental” status to allow for addition of other units, verification of acceptable abbreviations, and addition of the proposed table to existing Table 1.

320 Series - Scales**WWMA S&T-2 VC**

CONTACT PERSON: Paul Lewis

JURISDICTION: Rice Lake Weighing Systems

PROPOSAL CONSIDERED: Renumber sections S.6.4. and S.6.5., add S.6.4.3., and amend Table S.6.3.a. to establish appropriate prefixes for section capacity markings.

Amend last line of first column of Table S.6.3.a., as follows:

Table S.6.3.a. Marking Requirements					
To Be Marked With ↓	Weighing Equipment				
	Weighing, load-receiving, and indicating element in same housing or covered on the same CC ¹	Indicating element not permanently attached to weighing and load-receiving element or covered by a separate CC	Weighing and load-receiving element not permanently attached to indicating element or covered by a separate CC	Load cell with CC (11)	Other equipment or device (10)
Manufacturer's ID (1)	x	x	x	x	x
Model Designation and Prefix (1)	x	x	x	x	x
Serial Number and Prefix (2)	x	x	x	x	x (16)
Certificate of Conformance Number (CC) (23)	x	x	x	x	x (23)
Accuracy Class (17)	x	x(8)	x(19)	x	
Nominal Capacity (3)(18)(20)	x	x	x		
Value of Scale Division, "d" (3)	x	x			
Value of "e" (4)	x	x			
Temperature Limits (5)	x	x	x	x	
Concentrated Load Capacity (CLC) (12)(20)(22)		x	x (9)		
Special Application (13)	x	x	x		
Maximum Number of Scale Divisions (n_{max}) (6)		x(8)	x (19)	x	
Minimum Verification Scale Division (n_{min})			x (19)		
"S" or "M" (7)				x	
Direction of Loading (15)				x	
Minimum Dead Load				x	
Maximum Capacity				x	
Safe Load Limit				x	
Load Cell Verification Interval (v_{min}) (21)				x	
Section Capacity and Prefix (14)(20)(22)		x	x		

Note: For applicable notes, see Table S.6.3.b.

¹Weighing/load receiving elements and indicators which are in the same housing or which are permanently attached will generally appear on the same CC. If not in the same housing, elements shall be hard wired together or sealed with a physical seal or an electronic link. This requirement does not apply to peripheral equipment that has no input or effect on device calibrations or configurations.

(Added 1990) (Amended 1992, 1999, 2000, 2001, and 2002) (Footnote 1 Added 2001)

Renumber Sections S.6.4 and S.6.5., and add S.6.4.3., as follows:

S.6.4. Section Capacity

S.6.4.1. Railway Track Scales. – A railway track scale shall be marked with the maximum capacity of each section of the load receiving element of the scale. Such marking shall be accurately and conspicuously presented on, or adjacent to, the identification or nomenclature plate that is attached to the indicating element of the scale. *The nominal capacity of a scale with more than two sections shall not exceed twice its rated section capacity. The nominal capacity of a two-section scale shall not exceed its rated section capacity.*

*[*Nonretroactive as of January 1, 2002]*
(Amended 1988, 2001, and 2002)

S.6.5.4.2. Livestock Scales. – A livestock scale shall be marked with the maximum capacity of each section of the load-receiving element of the scale. Such marking shall be accurately and conspicuously presented on, or adjacent to, the identification or nomenclature plate that is attached to the indicating element of the scale. *The nominal capacity of a scale with more than two sections shall not exceed twice its rated section capacity. The nominal capacity of a two-section scale shall not exceed its rated section capacity*.*

*[*Nonretroactive as of January 1, 2003]*
(Added 2002)

S.6.4.3. Section Capacity Prefix. – **The section capacity shall be prefaced by the words “Section Capacity” or an abbreviation of that term. Acceptable abbreviations shall be “SC,” “Sec Cap,” “S Cap,” or “Sec C.”**

JUSTIFICATION: The amendments and clarification of “section capacity” marking requirements is necessary to prevent potential interpretations by inspectors that the term “section capacity” may not be abbreviated.

REASONS FOR: Some ID badges produced by various scale manufacturers have insufficient space on the badge to spell out “section capacity.” Rice Lake Weighing Systems, for example, has indicated that its badges allow only five characters for an identifier.

ADDITIONAL CONSIDERATIONS: Because section capacities apply only to scales, this amendment affects no other codes and similar amendments are not needed for marking requirements of other device types.

2003 WWMA Recommendation:

The WWMA S&T Committee heard comments from the NTETC Weighing Sector and manufacturers in support of the intent of the proposal, however, believes that the proposal should be amended for clarification and simplicity. A recommendation was made to delete “SC” and “S Cap” since they could be misinterpreted as “scale capacity.” Additionally, a recommendation was made to add section capacity abbreviations to G-S.I. Identification since G-S.I. which contains abbreviations for other required markings. The submitter provided the WWMA S&T alternate language developed in conjunction with the Weighing Sector as shown below.

The WWMA recommends the following alternate proposal:

Table S.6.3.a. Marking Requirements					
To Be Marked With ↓	Weighing Equipment				
	Weighing, load-receiving, and indicating element in same housing or covered on the same CC ¹	Indicating element not permanently attached to weighing and load-receiving element or covered by a separate CC	Weighing and load-receiving element not permanently attached to indicating element or covered by a separate CC	Load cell with CC (11)	Other equipment or device (10)
Manufacturer's ID (1)	x	x	x	x	x
Section Capacity and Prefix (14)(20)(22)(24)		x	x		
<p>Note: For applicable notes, see table S.6.3.b.</p> <p>¹Weighing/load receiving elements and indicators which are in the same housing or which are permanently attached will generally appear on the same CC. If not in the same housing, elements shall be hard wired together or sealed with a physical seal or an electronic link. This requirement does not apply to peripheral equipment that has an input or effect on device calibrations or configurations.</p>					

Table S.6.3.b. Notes For Table S.6.3.a.
<p>23. Required only if a CC has been issued for the device or equipment. [Nonretroactive as of January 1, 2003] (G-S.1. Identification (f) Added 2001)</p> <p>24. The section capacity shall be prefaced by the words "Section Capacity" or an abbreviation of that term. Acceptable abbreviations shall be "Sec Cap" or "Sec C." All capital letters and periods may be used.</p>

WWMA S&T-3 W

CONTACT PERSON: Jack Kane

JURISDICTION: State of Montana

PROPOSAL CONSIDERED: Amend S.6.5. Livestock Scales, Table S.6.3.a., N.1.3.4.2., and N.1.3.8., as follows:

Amend S.6.5. Livestock Scales:

S.6.5. Livestock Scales. – A livestock scale shall be marked with the nominal capacity of the scale ~~maximum capacity of each section of the load-receiving element of the scale. Such marking shall be accurately and conspicuously presented on, or adjacent to the identification or nomenclature plate that is attached to the indicating element of the scale. The nominal capacity of a scale with more than two sections shall not exceed twice its rated section capacity. The nominal capacity of a two-section scale shall not exceed its rated section capacity.~~
[Nonretroactive as of January 1, 2003]
(Added 2002)

Amend Table S.6.3.a. Marking Requirements by adding a reference to Note 22 of Table S.6.3.b., as follows:

Table S.6.3.a. Marking Requirements					
To Be Marked With ↓	Weighing Equipment				
	Weighing, load-receiving, and indicating element in same housing or covered on the same CC ¹	Indicating element not permanently attached to weighing and load-receiving element or covered by a separate CC	Weighing and load-receiving element not permanently attached to indicating element or covered by a separate CC	Load cell with CC (11)	Other equipment or device (10)
Manufacturer's ID (1)	x	x	x	x	x
Model Designation and Prefix (1)	x	x	x	x	x
Serial Number and Prefix (2)	x	x	x	x	x (16)
Certificate of Conformance Number (CC) (23)	x	x	x	x	x (23)
Accuracy Class (17)	x	x(8)	x(19)	x	
Nominal Capacity (3)(18)(20)(22)	x	x	x		
Value of Scale Division, "d" (3)	x	x			
Value of "e" (4)	x	x			
Temperature Limits (5)	x	x	x	x	
Concentrated Load Capacity (CLC) (12)(20)(22)		x	x (9)		
Special Application (13)	x	x	x		
Maximum Number of Scale Divisions (n_{\max}) (6)		x(8)	x (19)	x	
Minimum Verification Scale Division (n_{\min})			x (19)		
"S" or "M" (7)				x	
Direction of Loading (15)				x	
Minimum Dead Load				x	
Maximum Capacity				x	
Safe Load Limit				x	
Load Cell Verification Interval (v_{\min}) (21)				x	
Section Capacity (14)(20)(22)		x	x		

Note: For applicable notes, see Table S.6.3.b.

¹Weighing/load receiving elements and indicators which are in the same housing or which are permanently attached will generally appear on the same CC. If not in the same housing, elements shall be hard wired together or sealed with a physical seal or an electronic link. This requirement does not apply to peripheral equipment that has no input or effect on device calibrations or configurations.

(Added 1990) (Amended 1992, 1999, 2000, 2001, ~~and 2002, and 200X~~) (Footnote 1 Added 2001)

Amend Notes 14 and 22 in Table S.6.3.b. Notes for Table S.6.3.a., as follows:

14. Required on ~~livestock~~ and railway track scales. When marked on vehicle and axle-load scales manufactured before January 1, 1989, it may be used as the CLC. For livestock scales manufactured between January 1, 1989 and January 1, 2003, required markings may be either CLC or section capacity. [^{*}Nonretroactive as of January 1, 2003~~X~~]
(Amended 2002)

22. Combination vehicle/livestock scales must be marked with ~~both~~ the CLC for vehicle weighing, and the ~~section~~ nominal capacity for livestock weighing. All other requirements relative to these markings will apply. [^{*}Nonretroactive as of January 1, 2003~~X~~]
(Added 2002)

Amend N.1.3.4.2. (adopted at the 2003 Annual Meeting of NCWM), as follows:

N.1.3.4.2. Prescribed Test Pattern and Test Loads for Livestock Scales with more Than Two Sections and Combination Vehicle/Livestock Scales. A minimum test load of 5000 kg (10,000 lb) ~~or one-half of the rated section capacity or one-fourth of the marked nominal capacity~~, whichever is less, shall be placed, as nearly as possible, successively over each main support as shown in the diagram below. For livestock scales manufactured between January 1, 1989, and January 1, 2003, the required loadings shall be no greater than one-half CLC. (Two-section livestock scales shall be tested consistent with N.1.3.8.)

Amend N.1.3.8. (amendments adopted at the 2003 Annual Meeting of NCWM), as follows:

N.1.3.8. All other scales Except Crane Scales, Hanging Scales, Hopper Scales, Wheel-Load Weighers, and Portable Axle-Load Weighers. A shift test shall be conducted using the following prescribed test loads and test patterns. For livestock scales the shift test shall not exceed one-half the rated ~~section~~ nominal capacity.

JUSTIFICATION: While marked maximum sectional capacity and CLC values are necessary to define testing limits for Railway, Vehicle, and Axle Load scales which may have a large percentage of the nominal capacity applied to a small part of the load receiving platform, they are not necessary for livestock scales where the load will be more evenly dispersed over the load receiving element due to the nature of the commodity being weighed. Consider, for example, a 9' X 18' two-section livestock scale with a capacity of 20,000 lbs. As currently written in HB44, where section capacity is equal to nominal capacity for a two-section scale, this device would have to be shift-tested with test weights up to 18,000 lbs (90% of the section capacity) on each section and at mid-span for NTEP certification. For HB44 testing, the proposed changes do not change test loads currently listed. Justification offered for testing with these large test loads has been that the livestock will seek a corner when put on a scale. This may be true, if one is weighing one or two animals, however, even then, only two or three cows can fit in the area where a shift test would be performed and the combined weight of these animals will rarely exceed 3,000 lbs at the maximum! With the exception of sales ring scales, most scales that are used to weigh cattle, pigs, or sheep are going to be loaded with as many animals that will fit within the confines of the stock rack fitted to the scale, resulting in a well-distributed load.

REASONS FOR: Currently, several manufacturers' NTEP Certificates of Conformance for approved livestock scales do not comply with S.6.5, nor is there any reason to do so. As long as the devices are designed to meet N.1.3.4. and N.1.3.8., as well as other pertinent performance tests, the rated sectional capacity is irrelevant.

2003 WWMA Recommendation:

The WWMA heard comments from a scale manufacturer opposing this proposal because deletion of requirements for section capacity markings on livestock scales would create a liability concern for the manufacturer in that potential overloading of a section could compromise the structural integrity of the scale. NIST WMD also expressed caution that other requirements such as N.1.3.4.(b). Vehicle Scales, Axle-Load Scales and Livestock Scales; Maximum Loading may be affected if "section capacity" is removed from other livestock requirements in the Scales Code (The Committee noted that N.1.3.4.(b) no longer uses the term "section capacity" in language adopted by the NCWM at its July 2003 Annual Meeting).

The Committee learned that the proposal stems from a concern of a single manufacturer and believes that modifications to Handbook 44 may not be appropriate if only limited devices do not conform to existing section capacity requirements.

The NIST Technical Advisor to the NTETC Weighing Sector reported that the Sector did not reach a consensus on this proposal at their 2003 meeting.

The Committee discussed the development of the current language in NIST Handbook 44. In 2001, both public and private sectors involved in weighing operations developed sound design principles to ensure the suitability of scales for a particular commercial use. The relationship of the nominal capacity to the section capacity is based on technically valid criteria established for the design of railway track scales. In 2002, equipment manufacturers agreed that the relationship of nominal capacity to section capacity used for railway track scales was technically acceptable for scales used to weigh livestock.

Based upon information provided, the Committee believed that the existing section capacity requirements are appropriate and withdrew this item from their agenda.

WWMA S&T-4 W

CONTACT PERSON: Michael S. George

JURISDICTION: State of Nevada, Dept. of Agriculture –
Division of Measurement Standards

PROPOSAL CONSIDERED: Add new paragraphs S.1.1.14 and N.1.1.1. to require a pre-programmed price look-up code in all programmable electronic computing scales, as follows:

S.1.14. Price Look-Up Inspector Test Code. – A price look-up code (PLU) is to be reserved for inspection of computing scale. The code is to be set at a tare of zero and a unit price of \$1.00 per pound.

N.1.1.1. Price Look-Up Test. – Set scale into inspector/repairman test code, then perform all applicable tests as required.

JUSTIFICATION: An inspector test code would make accessing programmed price and tare data in scales less intrusive on store personnel who typically cannot reset or program scales. Most scale operators only know how to select a PLU or touch an area on a touch-screen to select desired product sales information.

REASONS FOR: As systems become increasingly computer-based and more manufacturers enter the field of producing scales, inspectors are experiencing increased difficulty in getting store personnel to operate scale functions for inspections. Many inspectors do not have access to all owner/operator manuals from the many different scale manufacturers in order to determine applicable scale operation features and functions.

ADDITIONAL CONSIDERATIONS: None Provided

2003 WWMA Recommendation:

The WWMA heard comments that questioned the format of the required (proposed) PLU, whether they are specific numbers, words or symbols. A recommendation was made that manufacturers set aside one open price key. The Committee considered the comments and alternative suggestion and is concerned that some price computing scales may not have sufficient room for a “test” key” and that open unit price keys may facilitate fraud to the device owner through “buddy sales.” Additionally, if the justification provided by the submitter is for ease or convenience of testing, Handbook 44 provides adequate language in G-UR.4.4. Assistance In Testing Operations.

The WWMA S&T Committee withdrew this item.

WWMA S&T-5 W

CONTACT PERSON: Gary Lameris

JURISDICTION: Hobart Corporation

PROPOSAL CONSIDERED: Amend S.1.12. as follows:

S.1.12. Manual Gross Weight Entries. – A device shall accept an entry of a manual gross weight value only when the scale is at gross load zero and the scale indication is at zero in the gross weights display mode. Recorded manual weight entries except those on labels generated for packages of standard weights, shall identify the weight value as a manual weight entry by one of the following terms: “Manual Weight,” “Manual Wt,” or “MAN WT.” The use of a symbol to identify multiple manual weight entries on a single document is permitted, provided that the symbol is defined on the same page on which the manual weight entries appear and the definition of the symbol is automatically printed by the recording element as part of the document.

[Nonretroactive as of January 1, 1993]

(Added 1992)

JUSTIFICATION: The 2003 edition of NIST Handbook 44 has what appears to be a typographical error in S.1.12. of the Scales Code. The word 'gross' is missing from the text whereas it had been present in previous editions. The deletion of the word "gross" was not approved by an NCWM vote, and should be reviewed.

REASONS FOR: According to the submitter, Tina Butcher of NIST has indicated that the omission resulted from a typographical error, and will be corrected in the 2004 edition of Handbook 44. However, the submitter believes that the committee should note this error until resolved.

2003 WWMA Recommendation:

The WWMA appreciated the suggestions from Hobart Corporation. The Committee confirmed with the NIST Technical Advisor that the editorial changes had already been noted and incorporated in the 2004 Edition of NIST Handbook 44.

The WWMA S&T Committee withdrew this item.

WWMA S&T-6 W

CONTACT PERSON: Gary Lameris JURISDICTION: Hobart Corporation

PROPOSAL CONSIDERED: Amend S.6.1. as follows:

S.6.1. Nominal Capacity; Vehicle and Axle-Load Scales. - *For all vehicle, and axle-load, scales, the marked nominal capacity shall not exceed the concentrated load capacity (CLC) times the quantity of the number of sections in the scale minus 0.5*

JUSTIFICATION: The 2003 edition of NIST Handbook 44 has what appears to be a typographical error in S.1.12. of the Scales Code. The word 'and' is missing from the text whereas it had been present in previous editions. The deletion of the word "and" was not approved by an NCWM vote, and should be reviewed.

REASONS FOR: According to the submitter, Tina Butcher of NIST has indicated that the omission resulted from a typographical error, and will be corrected in the 2004 edition of Handbook 44. However, the submitter believes that the committee should note this error until resolved.

2003 WWMA Recommendation:

The WWMA appreciated the suggestions from Hobart Corporation. The Committee confirmed with the NIST Technical Advisor that the editorial changes had already been noted and incorporated in the 2004 Edition of NIST Handbook 44.

The WWMA S&T Committee withdrew this item.

WWMA S&T-7 W

CONTACT PERSON: Gary Lameris JURISDICTION: Hobart Corporation

PROPOSAL CONSIDERED: Add (re-incorporate) Section T.2.6., as follows:

T.2.6. Grain Test Scales. The sensitivity shall be as stated in T.N.6. (Amended 1987)

JUSTIFICATION: The 2003 edition of NIST Handbook 44 has what appears to be a typographical error in having omitted T.2.6. of the Scales Code. The section is missing from the text whereas it had been present in previous editions. The deletion of the section was not approved by an NCWM vote, and should be reviewed.

REASONS FOR: According to the submitter, Tina Butcher of NIST has indicated that the omission resulted from a typographical error, and will be corrected in the 2004 edition of Handbook 44. However, the submitter believes that the committee should note this error until resolved.

2003 WWMA Recommendation:

The WWMA appreciated the suggestions from Hobart Corporation. The Committee confirmed with the NIST Technical Advisor that the editorial changes had already been noted and incorporated in the 2004 Edition of NIST Handbook 44.

The WWMA S&T Committee withdrew this item.

321 Series – Belt Conveyor Scales Systems

WWMA S&T-8 VC

CONTACT PERSON: Bill Ripka

JURISDICTION: Thermo Ramsey

PROPOSAL CONSIDERED: Amend paragraphs N.3.1.2. and N.3.1.3., as follows:

N.3.1.2. Initial Stable Zero. - The conveyor system shall be run to warm up the belt and the belt scale shall be zero adjusted as required. A series of zero-load tests shall be carried out until three consecutive zero-load tests each indicate an error which does not exceed $\pm 0.06\%$ ~~of the full-scale capacity of the totalized load at full scale capacity for the duration time of the test,~~ or ± 1 division, whichever is less. No adjustments can be made during the three consecutive zero-load test readings.

N.3.1.3. Test of Zero Stability. - The conveyor system shall be run to warm up the belt and the belt scale shall be zero adjusted as required. A series of zero-load tests shall be carried out immediately before the simulated or materials test until the three consecutive zero-load tests each indicate an error which does not exceed $\pm 0.06\%$ ~~of the full-scale capacity of the totalized load at full scale capacity for the duration time of the test,~~ or ± 1 division, whichever is less. No adjustments can be made during the three consecutive zero-load test readings.

Immediately after material has been weighed over the belt-conveyor scale during the conduct of the materials test, the zero-load test shall be repeated. The zero error from this test shall not exceed $\pm 0.12\%$ ~~of the full-scale capacity of the totalized load at full scale capacity for the duration time of the test,~~ or ± 2 divisions, whichever is less.

JUSTIFICATION: The addition of % and the defining of the stability of zero was added in 2002. The change was made, in part, to become consistent with requirements that exist in OIML R-50. R-50 uses the % allowable error defined as x % “of a load totalized at the maximum flow-rate for the duration of the totalization”. As written, stating only the % of full scale would indicate an allowable error that could be quite significant, almost always forcing the allowable error to be determined via number of divisions. The change was intended to, at least partially, view dynamic weighing using percentages instead of divisions. Examples of the allowable errors using division, % of full scale and % of capacity for the test duration are shown in the table below.

FULL SCALE CAP (TPH)	BELT SPEED (FPM)	BELT LOAD (#/FT)	BELT LENGTH (FT)	BELT REV TIME (min)	TIME PER 3 REV (min)	3 REV LOAD (ton)	10 MIN LOAD (ton)	"d" SIZE	MTL (ton)	.06% OF CAP (ton)	.06% OF MTL (ton)
250	250	33.33	200	.8	2.40	10.00	41.67	.02	41.67	.15	.025
500	300	55.56	250	.83	2.50	20.83	83.33	.05	83.33	.3	.05
650	300	72.22	225	.75	2.25	24.38	108.33	.1	108.33	.39	.065
1000	650	51.28	1500	2.31	6.92	115.38	166.67	.1	166.67	.6	.1
3000	700	142.86	1800	2.57	7.71	385.71	500.00	.5	500.00	1.8	.3
5000	500	333.33	1800	3.6	10.8	900.00	833.33	.5	900.00	3	.57

(Table – Comparison of .06% of capacity to .06% of test load)

REASONS FOR: No additional information submitted.

2003 WWMA Recommendation:

The WWMA heard comments in support of this item. The WWMA S&T Committee determined that WWMA S&T-8 and WWMA S&T-9 should be combined because they are overlapping items and that the second paragraph in N.3.1.3 correctly belongs in T. Tolerances. The WWMA recommends the following:

Amend N.3.1.2. and N.3.1.3:

N.3.1.2. Initial Stable Zero. - The conveyor system shall be run to warm up the belt and the belt scale shall be zero adjusted as required. A series of zero-load tests shall be carried out until three consecutive zero-load tests each indicate an error which does not exceed $\pm 0.06\%$ ~~of the full-scale capacity of the totalized load at full scale capacity for the duration time of the test,~~ or ± 1 division, whichever is less. No adjustments can be made during the three consecutive zero-load test readings.

N.3.1.3. Test of Zero Stability. - The conveyor system shall be run to warm up the belt and the belt scale shall be zero adjusted as required. A series of zero-load tests shall be carried out immediately before the simulated or materials test until the three consecutive zero-load tests each indicate an error which does not exceed $\pm 0.06\%$ ~~of the full-scale capacity of the totalized load at full scale capacity for the duration time of the test,~~ or ± 1 division, whichever is less. No adjustments can be made during the three consecutive zero-load test readings.

~~Immediately after material has been weighed over the belt-conveyor scale during the conduct of the materials test, the zero-load test shall be repeated. The zero error from this test shall not exceed $\pm 0.12\%$ of the full-scale capacity or ± 2 divisions, whichever is less.~~

~~(Added 2002) (Amended 200X)~~

Add new paragraph T.1.1. Tolerance Values – Test of Zero Stability, as follows:

T.1.1. Tolerance Values – Test of Zero Stability. Immediately after material has been weighed over the belt-conveyor scale during the conduct of the materials test, the zero-load test shall be repeated. The change in the accumulated or subtracted weight on the Master Weight Totalizer during the zero test shall not exceed 0.12% of the full-scale capacity of the totalized load at full scale capacity for the duration time of the test, or ± 2 divisions, whichever is less.
(Added 200X)

WWMA S&T-9 W

CONTACT PERSON: Steven Cook

JURISDICTION: NIST – 2002 Belt-Conveyor Scale Seminar

PROPOSAL CONSIDERED: Clarify the Test of Zero Stability and application of tolerances through reorganization of the provisions.

Amend N.3.1.3., as follows:

N.3.1.3. Test of Zero Stability. - The conveyor system shall be run to warm up the belt and the belt scale shall be zero adjusted as required. A series of zero-load tests shall be carried out immediately before the simulated or materials test until the three consecutive zero-load tests each indicate an error which does not exceed ± 0.06 % of the full-scale capacity or ± 1 division, whichever is less. No adjustments can be made during the three consecutive zero-load test readings.

~~Immediately after material has been weighed over the belt-conveyor scale during the conduct of the materials test, the zero-load test shall be repeated. The zero error from this test shall not exceed ± 0.12 % of the full-scale capacity or ± 2 divisions, whichever is less.~~

~~(Added 2002) (Amended 200X)~~

Add new paragraph T.1.1. Tolerance Values – Test of Zero Stability, as follows:

T.1.1. Tolerance Values – Test of Zero Stability. ~~Immediately after material has been weighed over the belt-conveyor scale during the conduct of the materials test, the zero-load test shall be repeated. The change in the accumulated or subtracted weight on the Master Weight Totalizer during the zero test shall not exceed 0.12 % of the full-scale capacity or ± 2 divisions, whichever is less.~~

~~(Added 200X)~~

JUSTIFICATION: Clarification of N.3.1.3 in regards to the amount of change permitted for the Master Weight Totalizer. Additionally, the maximum permissible change in the current Handbook 44 is more appropriately a device tolerance.

REASONS FOR: The tolerance statement identified as T.1.1 in this proposal was previously included under N.3.1.3 and more correctly belongs in Tolerances.

ADDITIONAL CONSIDERATIONS: None provided

2003 WWMA Recommendation:

The WWMA heard comments in support of this item. The WWMA S&T Committee determined that WWMA S&T-8 and WWMA S&T-9 should be combined because they are overlapping items. The Committee re-drafted WWMA S&T-8 and withdrew WWMA S&T-9 from the agenda.

WWMA S&T-10 VC

CONTACT PERSON: Bill Ripka

JURISDICTION:

Thermo Ramsey

PROPOSAL CONSIDERED: Amend paragraph N.3.1.4., as follows:

N.3.1.4. Check for Consistency of the Conveyor Belt Along Its Entire Length. – After a zero-load test with flow rate filtering disabled, the totalizer shall not change more than \pm three scale divisions from its initial indication during one complete revolution.

(Added 2002)

JUSTIFICATION: The intent of the N.3.1.4. requirements is to ensure that the conveyor belt is consistent in weight throughout its entire length. To meet this requirement, a belt must be the same size and thickness throughout its entire length. The types of splices, material and construction will play a major role in meeting consistent weight. During the stability tests, it is determined that the instrument (scale totalizer) is adjusted to average the entire belt to provide a zero reading over complete revolutions. Because a material load seldom uses an even revolution of the belt, it is necessary that the belt itself does not have variances great enough to affect the tolerance of the weighed load.

Interpretation differences have occurred regarding the current wording of “three scale divisions.” The addition of the “ \pm ” symbol will ensure that all regulators and regulated operators are reading and interpreting the requirement consistently.

REASONS FOR: No additional information submitted.

2003 WWMA Recommendation:

The WWMA heard comments in support of this item from a manufacturer and user.

The WWMA supports this item as submitted. WWMA recommends that the NCWM S&T Committee move the proposal forward as a voting item.

WWMA S&T-11 VC

CONTACT PERSON: Steven Cook

JURISDICTION: NIST – 2002 Belt-Conveyor Scale Seminar

PROPOSAL CONSIDERED: Amend S.1.5. and UR.1. regarding range of operation in order to harmonize Handbook 44 with OIML R50.

Amend S.1.5. as follows:

S.1.5. Rate of Flow Indicators and Recorders. - A belt-conveyor scale shall be equipped with a rate of flow indicator and an analog or digital recorder. Permanent means shall be provided to produce an audio or visual signal when the rate of flow is equal to or less than ~~35~~ 20 percent and when the rate of flow is equal to or greater than ~~98~~ 100 percent of the rated capacity of the scale. The type of alarm (audio or visual) shall be determined by the individual installation.
[Nonretroactive as of January 1, 200X]
(Amended 1989 and 200X)

Amend UR.1. as follows:

UR.1. Use Requirements. - A belt-conveyor scale system shall be operated between 35 percent and 98 percent of its rated capacity for systems installed prior to January 1, 200X. A belt-conveyor scale system installed after January 1, 200X shall be operated between 20 percent and 100 percent of its rated capacity.

JUSTIFICATION: During the Belt Conveyor Scale Sector meeting of 2002, there was considerable discussion about harmonization of the HB44 belt conveyor scale code with OIML R50. Also presented was some preliminary evidence that belt conveyor scales tested at zero and a single flow rate, such as specified by HB44, may have excessive errors at other flow rates.

REASONS FOR: Although many belt conveyor scales tend to operate at nearly the same flow rate most of the time, there are occasions of varying duration when the scale operates at different flow rates. Other devices in HB44 are tested throughout their rated operating range, and belt conveyor scales should be subject to similar testing to ensure accuracy at all ranges.

ADDITIONAL CONSIDERATIONS: None provided

2003 WWMA Recommendation:

The WWMA heard comments in support of this item from a manufacturer and user.

The WWMA supports this item as submitted. WWMA recommends that the NCWM S&T Committee move the proposal forward as a voting item.

WWMA S&T-12 VC

CONTACT PERSON: Steven Cook

JURISDICTION: NIST – 2002 Belt-Conveyor Scale Seminar

PROPOSAL CONSIDERED: Amend N.2. Conditions of Test and add new paragraphs N.2.1. and N.2.2. to require testing at different flow rates and to establish guidelines for such tests to ensure accuracy at varying rates.

Amend N.2., as follows:

N.2. Conditions of Test. - A belt-conveyor scale shall be tested after it is installed on the conveyor system with which it is to be used and under such environmental conditions as may normally be expected. ~~It shall be tested at normal use capacity and may also be tested at any other rate of flow that may be used at the installation. Each test shall be conducted for:~~ Each test shall be conducted with test loads no less than the minimum totalized load.

Add new paragraphs N.2.1. and N.2.2., as follows:

N.2.1. Initial Verification: A belt-conveyor scale system shall be tested at an intermediate flow rate, at 35 percent flow rates and normal use capacity. The system may also be tested at any other rate of flow that may be used at the installation

N.2.2. Subsequent Verification: Subsequent testing shall include testing at the normal flow rate and other flow rates used at the installation. The Official with statutory authority may determine that testing only at the normal flow rate is necessary for subsequent verifications if evidence is provided that the system is used to operate no less than 70 % of the maximum flow rate at least 80 percent of the time, or that normal operational flow rate does not vary by more than 10 % (e.g. If the normal flow rate is 70 % an acceptable range can be 63 to 73%).

JUSTIFICATION: The belt conveyor scale must be tested at several flow rates to verify that it maintains accuracy over a range of flow rates appropriate to the installation. This proposal was discussed during the Belt Conveyor Scale Sector meeting in 2002.

REASONS FOR: Current HB44 procedures do not clearly require testing at flow rates other than the normal operating flow rate. Belt conveyor scales often operate at other flow rates for varying time periods and need to provide accurate weighing at those other flow rates.

ADDITIONAL CONSIDERATIONS: None provided

2003 WWMA Recommendation:

The WWMA heard comments in support of this item from a manufacturer and user. There was also a comment that the proposed definition was redundant and may not be necessary. The WWMA S&T noted that this item overlaps with WWMA S&T-13. The Committee collaborated with the commenters and provided additional clarification of “minimum test load” that eliminated the need to amend Appendix D Definitions.

The WWMA S&T Committee re-drafted the proposal and WWMA supports this item as amended below:

N.2. Conditions of Test. - A belt-conveyor scale shall be tested after it is installed on the conveyor system with which it is to be used and under such environmental conditions as may normally be expected. ~~It shall be tested at normal use capacity and may also be tested at any other rate of flow that may be used at the installation. Each test shall be conducted for:~~ Each test shall be conducted with test loads no less than the minimum test load.

- ~~(a) not less than 1000 scale divisions~~
- ~~(b) at least three revolutions of the belt, and~~
- ~~(c) at least 10 minutes of operation, or for a normal weighing.~~

Add new paragraphs N.2.1., N.2.2., and N.2.3., as follows:

N.2.1. Initial Verification: A belt-conveyor scale system shall be tested at an intermediate flow rate, near 35 percent flow rates and normal use capacity. The system may also be tested at any other rate of flow that may be used at the installation

N.2.2. Subsequent Verification: Subsequent testing shall include testing at the normal flow rate and other flow rates used at the installation. The Official with statutory authority may determine that testing only at the normal flow rate is necessary for subsequent verifications if evidence is provided that the system is used to operate no less than 70 % of the maximum flow rate at least 80 percent of the time, or that normal operational flow rate does not vary by more than 10 % (e.g. If the normal flow rate is 70 % an acceptable range can be 63 to 73 %).

N.2.3. Minimum Test Load: The minimum test load shall not be less than the largest of the following values.

- (a) **800 scale divisions,**
- (b) **the load obtained at maximum flow rate in one revolution of the belt, or**
- (c) **at least 10 minutes of operation. The Official with Statutory Authority may determine that a shorter time down to 2% of the load totalized in one hour at the maximum flow rate may be used provided testing is performed that demonstrates that performance is not affected by the shorter test time and that 2% of the load totalized in one hour at the maximum flow rate is greater than the time to achieve (a) and (b) above.**

WWMA S&T-13 W

CONTACT PERSON: Steven Cook

JURISDICTION: NIST – 2002 Belt-Conveyor Scale Seminar

PROPOSAL CONSIDERED: Clarify issues regarding Minimum Totalized Load and Minimum Test Load.

Add new paragraph N.2.3., as follows:

N.2.3. Minimum Totalized Load: The minimum totalized load shall not be less than the largest of the following values.

- (a) **800 scale divisions,**
- (b) **the load obtained at maximum flow rate in one revolution of the belt, or**
- (c) **at least 10 minutes of operation. The Official with Statutory Authority may determine that a shorter time down to 2% of the load totalized in one hour at the maximum flow rate may be used provided testing is performed that demonstrates that performance is not affected by the shorter test time and that 2% of the load totalized in one hour at the maximum flow rate is greater than the time to achieve (a) and (b) above.**

Amend UR.1.1., as follows:

UR.1.1. Minimum Totalized Load. - Delivered quantities of less than the minimum test load or minimum totalized load shall not be considered a valid weighment.

Amend Appendix D – Definition of “minimum totalized load,” as follows:

minimum totalized load (MTL). The least amount of weight for which the scale is considered to be performing accurately. See also minimum test load.

Add new definition to Appendix D, as follows:

minimum test load (MTL). The least amount of weight for which the scale is considered to be performing accurately.

JUSTIFICATION: The Minimum Totalized Load is not clearly defined in HB44. This proposal will improve the definition of the Minimum Totalized Load and will provide a definition for “minimum test load,” making the terms synonymous.

REASONS FOR: Some belt conveyor scale systems need to deliver a weighed quantity in less than 10 minutes. The term “minimum delivery” is presently defined in Appendix D as “The least amount of weight that is to be delivered as a single weighment by a belt-conveyor scale system in normal use.” This proposal clarifies testing requirements for those scales.

ADDITIONAL CONSIDERATIONS: None provided

2003 WWMA Recommendation:

The WWMA S&T Committee amended this proposal by incorporating proposed N.2.3 into WWMA S&T 12 and deleting the proposed amendments to Appendix D definitions. The WWMA S&T Committee withdrew this item from its agenda.

WWMA S&T-14 VC

CONTACT PERSON: Steven Cook

JURISDICTION: NIST – 2002 Belt-Conveyor Scale Seminar

PROPOSAL CONSIDERED: Amend T.3.1.1. to reduce the allowable variation regarding temperature effect on zero-load balance to harmonize the requirements with OIML R50.

Amend T.3.1., as follows:

T.3.1.1. Effect on Zero-Load Balance. – The zero-load indication shall not change by more than ~~0.07~~ 0.035 percent of the rated capacity of the scale (without the belt) for a change in temperature of 10 °C (18 °F) at a rate not to exceed 5 °C (9 °F) per hour.

JUSTIFICATION: 0.035% is the appropriate value for a belt conveyor scale. The value 0.07 was originally introduced based upon consistency with the new scales code in 1986 (and R 76 for non automatic weighing systems) before the completion of the 1994 Edition of OIML R50 (superseded the 1980 Edition that did not include influence factor testing).

REASONS FOR: No additional information submitted

ADDITIONAL CONSIDERATIONS: Data for “ACTIVE” NTEP Certificates of Conformance should be re-evaluated for compliance with the proposed amendments in order to determine the potential need for reevaluation of devices.

2003 WWMA Recommendation:

The WWMA heard comments in support of this item from a manufacturer and user.

The WWMA supports this item as submitted and agrees that existing data from “Active” Certificates of Conformance should be reevaluated to address retroactive status of the recommended language.

WWMA S&T-15 VC

CONTACT PERSON: Tom Vormittag

JURISDICTION: SGS Minerals Services

PROPOSAL CONSIDERED: Amend UR.2.2.(b) to clarify the need to provide clearance around “live” portions of belt conveyor scale.

Amend UR.2.2.(b), as follows:

- (b) **Live Portions of Scale – All live portions of the scale shall be protected by appropriate guard devices to prevent accidental interference with the weighing operation. Clearance shall be provided around all live parts to avoid any location where an object may wedge in the scale structure. Also, see U.R. 3.2.**

JUSTIFICATION: The existing user requirement regarding live portions of the scale is limited to a requirement for guards to prevent foreign objects from contacting components. Adequate clearance is of equal importance to prevent errant material from jamming or impeding the free motion of moving components of metrological criticality.

REASONS FOR: Scale structure may need more clearance after ordinary installation by a manufacturer or service agent due to the nature of the material the device is weighing or other environmental factors. A user requirement regarding adequate clearance is appropriate, as installers may not anticipate the future influences of these factors on the performance of the device.

ADDITIONAL CONSIDERATIONS: None provided

2003 WWMA Recommendation:

The WWMA heard comments in support of this item from a manufacturer and user, however, considered that the proposed language should be amended to reduce ambiguity and emphasize compliance with manufacturer recommendations in General Code paragraphs G-UR.2.1. Installation and G-UR.3.1. Method of Operation.

The WWMA S&T Committee collaborated with the commenter to amend the proposal regarding UR.2.2.(b). WWMA recommends the following revised proposal:

- (b) **Live Portions of Scale – All live portions of the scale shall be protected by with appropriate guard devices and clearances, as recommended by the scale manufacturer, to prevent accidental interference with the weighing operation. Also, see U.R. 3.2.**

WWMA S&T-16 VC

CONTACT PERSON: Tom Vormittag JURISDICTION: SGS Minerals Services

PROPOSAL CONDIDERED: Amend UR.3.2. to clarify and enhance the user's responsibility to prevent the re-circulation of previously weighed material through accumulation on the belt.

Amend UR.3.2., as follows:

UR.3.2. Maintenance. – Belt-conveyor scales and idlers shall be maintained and serviced in accordance with manufacturer's instructions and the following:

- (a) **The scale and area surrounding the scale shall be kept clean of debris or other foreign material that can detrimentally affect the performance of the system. Weighed material shall not adhere to the belt and return to the weighing area.**

JUSTIFICATION: The existing user requirement regarding cleanliness is limited to removal of "debris" or "foreign material." If material that is being weighed as a saleable commodity is allowed to stick or freeze to a conveyor belt, the true weight of delivered product, determined by the scale, is in question. The Belt-Conveyor Scale Systems Code currently has no requirement for keeping material that has already been weighed off of a conveyor belt that will continue to pass over the load-receiving element of the system. (Example of means to comply: Use of a belt scraper at the head-pulley and, perhaps, a secondary scraper elsewhere on the conveyor belt system)

REASONS FOR: No additional information submitted

ADDITIONAL CONSIDERATIONS: None provided

2003 WWMA Recommendation:

The WWMA heard comments in support of this item from a manufacturer and user, however, that the proposed language should be amended to clarify the intent of the proposal.

The WWMA S&T Committee collaborated with the commenters to amend the proposal for UR.2.2.(b). WWMA recommends the following revised proposal:

Amend the proposal for UR.2.2.(b), as follows:

UR.3.2. Maintenance. – Belt-conveyor scales and idlers shall be maintained and serviced in accordance with manufacturer's instructions and the following:

- (a) The scale and area surrounding the scale shall be kept clean of debris or other foreign material that can detrimentally affect the performance of the system.
- (b) There shall be provisions to ensure that weighed material does not adhere to the belt and return to the weighing area.

(Renumber remaining paragraphs)

330 Series – Liquid Measuring Devices**WWMA S&T-17 D**

CONTACT PERSON: Richard Suiter JURISDICTION: NIST Weights and Measures Division

PROPOSAL CONSIDERED: Modify Liquid-Measuring Devices Code paragraph S.4.4.2 Location of Marking Information; Retail Motor-Fuel Dispensers as follows:

S.4.4.2. Location of Marking Information; Retail Motor-Fuel Dispensers. – The required marking information in the General Code, Paragraph G-S.1. shall appear as follows:

- (a) *Placement of this information shall not be on a portion of the device that can be readily removed or interchanged without the use of a tool separate from the device.*
- (b) *The information shall appear 24 inches to 60 inches from the base of the dispenser when placed on the outside of the device.*
- (c) ~~*When This information may be placed behind an access door or panel which may require the use of a key or other tool separate from the device for access. In this case, the information shall appear 24 inches to 60 inches from the base of the dispenser in a readily legible position. The use of a dispenser key shall not be considered a tool separate from the device.*~~
[Nonretroactive as of January 1, 2003]

JUSTIFICATION: The current language in paragraph S.4.4.2.(c) as written can be interpreted to allow the placement of G-S.1. Identification markings on a door or panel that is removable. Additionally, existing wording might be interpreted to allow placement of marking information on a panel that can be easily removed through the use of a key (e.g. lower meter access panels). This interpretation would be in conflict with paragraph S.4.4.2.(a).

REASONS FOR: The proposed modifications to paragraph S.4.4.2.(c) clarifies the original intent, whereby it is acceptable to place G-S.1. information on permanent components located 24 inches to 60 inches above the base of the dispenser within the dispenser cabinet; however, those components can only be accessed by opening a door or panel that requires the use of a key or other tool separate from the device.

ADDITIONAL CONSIDERATIONS: Scales Code paragraph S.6.2. Location of Marking Information includes similar language that allows for access of required marking information.

2003 WWMA Recommendation:

The WWMA was notified that this item will be considered at the 2003 meeting of the NTETC Measuring Sector and heard no other comments on this item. The WWMA believes that there is insufficient justification to allow additional tools separate from the device, other than a dispenser key, to be used to access identification information.

The WWMA recommends that this item remain developmental.

WWMA S&T-18 VC

CONTACT PERSON: Richard Suiter

JURISDICTION: NIST Weights and Measures Division

PROPOSAL CONSIDERED: Align the Acceptance Tolerance and Special Test Tolerance in the Liquid Measuring Devices Code for 0.3 Accuracy Class meters with corresponding tolerances in the Vehicle Tank Meters Code.

Modify Liquid Measuring Devices Code Table T.2. Accuracy Classes for Liquid Measuring Devices Covered in NIST Handbook 44 Section 3.30 as follows:

Table T.2. Accuracy Classes for Liquid Measuring Devices Covered in NIST Handbook 44 Section 3.30				
Accuracy Class	Application	Acceptance Tolerance	Maintenance Tolerance	Special Test Tolerance
0.3	Petroleum products including large capacity motor fuel devices (flow rates over 115 L/min (30 gpm))**, heated products at or greater than 50 °C asphalt at or below temperatures 50 °C, all other liquids not shown where the typical delivery is over 200 L (50 gal)	0.215 %	0.3 %	0.45 %
0.3A	Asphalt at temperatures greater than 50 °C	0.3 %	0.3 %	0.5 %
0.5*	Petroleum products delivered from small capacity (at 4 L/min (1 gpm) through 115 L/min (30 gpm))** motor-fuel devices, agri-chemical liquids, and all other applications not shown.	0.3 %	0.5 %	0.5%
1.1	Petroleum products and other normal liquids from devices with flow rates** less than 1 gpm and devices designed to deliver less than one gallon.	0.75 %	1.0 %	1.25%
<p>*The maintenance tolerances on normal and special tests for 5-gallon and 10-gallon test drafts are 6 cubic inches and 11 cubic inches, respectively. Acceptance tolerances on normal and special tests are 3 cubic inches and 5.5 cubic inches.</p> <p>** Flow rate refers to designed or marked maximum flow rate.</p>				

JUSTIFICATION: Currently NIST Handbook 44 Liquid Measuring Devices (LMD), Vehicle Tank-Meters (VTM), and Mass Flow Meters (MFM) Codes include different tolerances for 0.3 Accuracy Class meters. This creates a technical inconsistency among the codes. Tighter tolerances are applied to vehicle-mounted meters than stationary meters even though the same model of meter may be used in both applications. There is no technical justification for this difference. A similar inconsistency in tolerances is found between the MFM, LMD, and VTM Codes.

ADDITIONAL CONSIDERATIONS: **Potential Reason for Opposition:** The proposed changes will result in the application of slightly tighter tolerances to LMD's than are in the current code.

2003 WWMA Recommendation:

The WWMA was notified that this item will be considered at the 2003 meeting of the NTETC Measuring Sector and heard no other comments on this item.

The WWMA S&T Committee supports the concept that applicable tolerance should be equivalent in regard to products measured through the same type and class of device regardless of its installation (stationary or vehicle mounted).

337 Series – Mass Flow Meters

WWMA S&T-19 VC

CONTACT PERSON: Richard Suiter **JURISDICTION:** NIST Weights and Measures Division

PROPOSAL CONSIDERED: Align the Acceptance Tolerance and Special Test Tolerance in the Mass Flow Meters Codes for 0.3 Accuracy Class meter with corresponding tolerances in the Vehicle Tank Meters Code.

Modify Mass Flow Meters Code Table T.2. Accuracy Classes for Mass Flow Meter Applications as follows:

Table T.2. Accuracy Classes for Mass Flow Meter Applications				
Accuracy Class	Application or Commodity Being Measured	Acceptance Tolerance	Maintenance Tolerance	Special Tolerance
0.3	Loading rack meters, vehicle-tank meters, home heating oil, heated products (except asphalt above 50 EC), asphalt 50 EC or below, milk and other food products, large capacity motor-fuel dispensers (maximum discharge flow rates greater than 100 L or 25 gallon per minute), all other liquid applications not shown in the table where the minimum delivery is at least 700 kg (1500 lb)	0.215%	0.3%	0.45%
0.3A	Asphalt above 50 EC	0.3%	0.3%	0.5%
0.5	Small capacity (retail) motor-fuel dispensers, agri-chemical liquids, all other liquid applications not shown in the table	0.3%	0.5%	0.5%
1.0	Anhydrous ammonia, LP Gas (including vehicle tank meters)	0.6%	1.0%	1.0%
2.0	Compressed natural gas as a motor fuel	1.5%	2.0%	2.0%
2.5	Cryogenic liquid meters, liquefied compressed gases other than LP Gas	1.5%	2.5%	2.5%

JUSTIFICATION: Currently NIST Handbook 44 Liquid Measuring Devices (LMD), Vehicle Tank-Meters (VTM), and Mass Flow Meters (MFM) Codes include different tolerances for 0.3 Accuracy Class meters. This creates a technical inconsistency among the codes. Tighter tolerances are applied to vehicle-mounted meters than stationary meters even though the same model of meter may be used in both applications. There is no technical justification for this difference. A similar inconsistency in tolerances is found between the MFM, LMD, and VTM Codes.

ADDITIONAL CONSIDERATIONS: The Mass Flow Meters Code was developed with the understanding that all liquid measuring devices used in similar applications would be held to similar tolerances. **Potential Reason for Opposition:** The proposed changes will result in the application of slightly tighter tolerances to and MFM's than are in the current code.

2003 WWMA Recommendation:

The WWMA was notified that this item will be considered at the 2003 meeting of the NTETC Measuring Sector and heard no other comments on this item.

The WWMA S&T Committee supports the concept that tolerance should be the same for products measured through the same type and class of device regardless of its installation (stationary or vehicle mounted).

WWMA S&T-20 D

CONTACT PERSON: Gary Castro

JURISDICTION: California

PROPOSAL CONSIDERED: DEVELOPING ITEM:

Assimilate relevant subsections of Section 3.37, Mass Flow Meter Code of Handbook 44 into the following codes:

- 3.30 Liquid-Measuring Devices;
- 3.31 Vehicle-Tank Meters;
- 3.32 LPG and Anhydrous Ammonia Liquid-Measuring Devices;
- 3.33 Hydrocarbon Gas Vapor-Measuring Devices;
- 3.34 Cryogenic Liquid-Measuring Devices;
- 3.35 Milk Meters
- 3.36 Water Meters.

FOR EXAMPLE:

Section 3.30 Liquid Measuring Devices

A. Application

A.1 - This code applies to:

- (a) devices used for the measurement of liquids, including liquid fuels and lubricants, ~~and~~
- (b) wholesale devices used for the measurement and delivery of agri-chemical liquids such as fertilizers, feeds, herbicides, pesticides, insecticides, fungicides, and defoliant.
- (c) devices that are designed to dynamically measure the mass, or the mass and density of liquids.

Section 3.31 Vehicle Tank Meters

A. Application

A.1. - This code applies to:

- (a) meters mounted on vehicle tanks including those used for the measurement and delivery of petroleum products or agri-chemicals such as fertilizers, feeds, pesticides, defoliant, and bulk delivery of water.
- (b) devices that are designed to dynamically measure the mass, or the mass and density of liquids.

JUSTIFICATION: Many of the Mass Flow Meter code requirements are equivalent to those in other codes in Handbook 44, making it unnecessary to have a separate code.

REASONS FOR: To simplify and streamline Handbook 44 by removing an unnecessary code.

ADDITIONAL CONSIDERATIONS: By the submitter's estimate, over 80% of the Mass Flow Meter Code duplicates requirements in existing codes.

2003 WWMA Recommendation:

No change. WWMA recommends that this item remain as a developmental item.

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358 Series – Multiple Dimension Measuring Devices**WWMA S&T-21 VC**

CONTACT PERSON: Richard Suiter

JURISDICTION: Multiple Dimension Measuring Devices
Working Group

PROPOSAL CONSIDERED: Modify Handbook 44 Section 5.58. Multiple Dimension Measuring Devices, paragraph S.1.6. and Table S.1.6. and add new paragraph UR. 5. and new Table UR.5. as follows:

Delete existing Table S.1.6., as follows:

Table S.1.6. Information to be Provided on Multiple Dimension Measuring Systems				
Scenarios – Y	Scenario 1.1	Scenario 1.2	Scenario 1.3	Scenarios 2, 3, 4
Information – X	Customer present (printer only)	Customer present (display only)	Customer present (printer and display)	Customer is not present
System ID	P (only in multi-system applications)	D (only in multi-system applications)	D or P (only in multi-system applications)	P or A
Object ID	N/A	N/A	N/A	P or A
Dimensions and/or volume, units	P	D	D and P	P or A
Error indicator	P	D	D and P	N/A
Billing method	P	D	D or P	N/A
Billed weight	P	D	D or P	N/A
Total price	P	D	D or P	N/A
Dim weight (if applicable)	P	D	D or P	P or A
Scale weight (if applicable)	P	D	D or P	P or A
Tare (if applicable)	P	D	D or P	P or A
Oversized indicator	P	D	D or P	P or A
Dimensions are of smallest box	P or M	D or M	D or P or M	P or A
Billing rate or rate chart, conversion factors	A	A	A	P or A
D = DISPLAYED A = AVAILABLE UPON REQUEST (retained for at least 30 days after invoice) N/A = NOT APPLICABLE P = PRINTED M = MARKED ON THE DEVICE				

Amend S.1.6., as follows:

S.1.6. Customer Indications and Recorded Representations. – Multiple dimension measuring devices or systems must provide information as specified in Table S.1.6. As a minimum all devices or systems must be able to meet either column I or column II in Table S.1.6. (See Table Appendix at the end of this code.)

Add new, revised Table S.1.6., as follows:

Table S.1.6. Required Information to be Provided by Multiple Dimension Measuring Systems				
<u>Information parameter</u>	<u>Column I*</u>	<u>Column II*</u>		<u>Column III</u>
	<u>Provided by device</u>	<u>Provided by invoice or other means</u>		<u>Provided by invoice or other means as specified in contractual agreement</u>
		<u>Customer present</u>	<u>Customer not present</u>	
1 Device identification ¹	<u>D or P</u>	<u>P</u>	<u>P</u>	<u>P or A</u>
2 Error message (when applicable)	<u>D or P</u>	<u>P</u>	<u>N/A</u>	<u>N/A</u>
3 Hexahedron dimensions (if used) ⁴	<u>D or P</u>	<u>P</u>	<u>P</u>	<u>P or A</u>
4 Hexahedron volume (if used) ⁴	<u>D or P</u>	<u>P</u>	<u>P</u>	<u>P or A</u>
5 Actual weight (if used) ⁴	<u>D or P</u>	<u>P</u>	<u>P</u>	<u>P or A</u>
6 Tare (if used) ⁴	<u>D or P</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
7 Hexahedron measurement statement ²	<u>D or P or M</u>	<u>P</u>	<u>P</u>	<u>P or G</u>
<p>D = DISPLAYED, P = PRINTED or RECORDED IN A MEMORY DEVICE, M = MARKED, G = PUBLISHED GUIDELINES OR CONTRACTS, A = AVAILABLE UPON REQUEST BY CUSTOMER ³, N/A = NOT APPLICABLE</p> <p>Notes:</p> <p>1 This is only required in systems where more than one device or measuring element is being used.</p> <p>2 <u>This is an explanation that the dimensions and/or volume shown are those of the smallest hexahedron in which the object that was measured may be enclosed rather than those of the object itself.</u></p> <p>3 The information “available upon request by customer” shall be retained by the party having issued the invoice for at least 30 calendar days after the date of invoicing.</p> <p>4 Some devices or systems may not utilize all of these values; however as a minimum either hexahedron dimensions or hexahedron volume must be displayed or printed.</p> <p>* As a minimum all devices or systems must be able to meet either column I or column II.</p> <p>Hexahedron = An object with six plane surfaces.</p>				

Add new paragraph UR.5., as follows:

UR.5. Customer Information Provided. – The user of a multiple dimension measuring device or system shall provide transaction information to the customer as specified in Table UR.5.

Add new Table UR.5, as follows:

Table UR.5. Customer Information Provided			
<u>Parameter</u>	<u>No contractual agreement</u>		<u>Contractual agreement</u>
	<u>Customer present</u>	<u>Customer not present</u>	
<u>1 Object identification</u>	<u>N/A</u>	<u>P</u>	<u>P or A</u>
<u>2 Billing method (Scale or Dimensional weight if used)</u>	<u>D or P</u>	<u>P</u>	<u>P or A</u>
<u>3 Billing rate or rate chart</u>	<u>D or P or A</u>	<u>P or G or A</u>	<u>P or A</u>
<u>4 Dimensional weight (if used)</u>	<u>P</u>	<u>P</u>	<u>P or A</u>
<u>5 Conversion factor (if used)</u>	<u>D or P or A</u>	<u>P</u>	<u>P or G</u>
<u>6 Dimensional weight statement ¹ (if dimensional weight is used)</u>	<u>D or P</u>	<u>P</u>	<u>P or G</u>
<u>7 Total price</u>	<u>P</u>	<u>P</u>	<u>P or A</u>
<p><u>D = DISPLAYED, P = PRINTED, M = MARKED, G = PUBLISHED GUIDELINES OR CONTRACTS</u> <u>A = AVAILABLE UPON REQUEST BY CUSTOMER ², N/A = NOT APPLICABLE</u></p> <p><u>1 This is an explanation that the dimensional weight is not a true weight but is a calculated value obtained by applying a conversion factor to the hexahedron dimensions or volume of the object.</u></p> <p><u>2 The information “available upon request by customer” shall be retained by the party having issued the invoice for at least 30 calendar days after the date of invoicing.</u></p> <p><u>Hexahedron = An object with six plane surfaces.</u></p>			

JUSTIFICATION: The current Table S.1.6. contains specifications for devices or systems and user requirements. The manufacturer of a device or system is responsible for assuring compliance with Handbook 44 specifications. The owner or operator of a device or system is responsible for assuring that the device or system is used in a manner consistent with user requirements of Handbook 44.

REASONS FOR: Separating the requirements into two separate tables will aid manufacturers, users, and weights and measures officials in determining responsibility for complying with a particular requirement.

ADDITIONAL CONSIDERATIONS: This proposal originated from the July 2003 Meeting of the Multiple Dimension Measuring Devices Working Group. The Work Group supports the proposal. NCWM adoption of this item will aid in the effort to change the status of the Multiple Dimension Measuring Devices Code from tentative to permanent.

2003 WWMA Recommendation:

The WWMA heard comments from a manufacturer supporting the proposal that separates manufacturer specifications and user requirements.

The WWMA commends the MDMD Work Group and recommends the proposal.

WWMA S&T-22 VC

CONTACT PERSON: Richard Suiter

JURISDICTION: Multiple Dimension Measuring Devices
Working Group

PROPOSAL CONSIDERED: Modify Handbook 44 Section 5.58. Multiple Dimension Measuring Devices, paragraph S.1.8. and Note 7 of Table S.4.1.a. as follows:

Amend S.1.8., as follows:

S.1.8. Indications Below Minimum and Above Maximum. - Except for entries of tare, when objects are smaller than the minimum dimensions identified in paragraph S.1.7. or larger than ~~105 percent~~ any of the maximum dimensions plus 9 d, and/or maximum volume marked on the device plus 9 d, or when a combination of dimensions for the object being measured exceeds the measurement capability of the device, the indicating or recording element shall either:

- (a) not display or record any usable values, or
- (b) identify the displayed or recorded representation with an error indication.

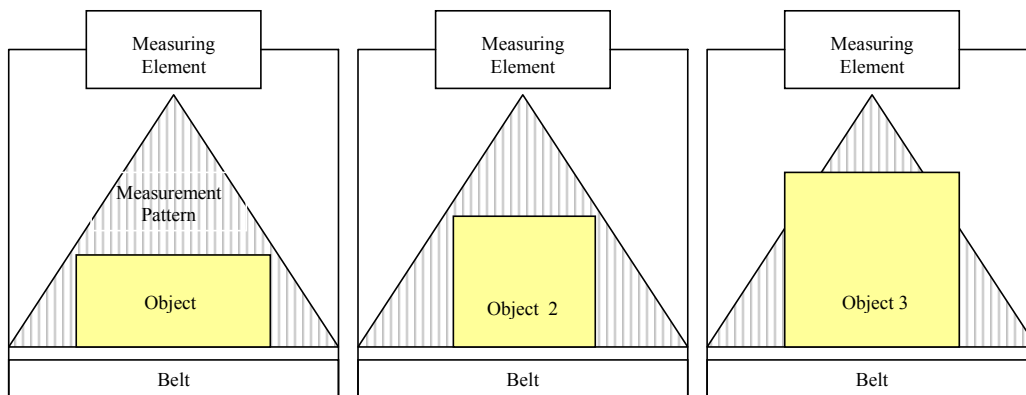
Table S.4.1.a. Marking Requirements for Multiple Dimension Measuring Systems				
To Be Marked With ↓	Multiple Dimension Measuring Equipment			
	Multiple dimension measuring device and indicating element in same housing	Indicating element not permanently attached to multiple dimension measuring element	Multiple dimension measuring element not permanently attached to the indicating element	Other equipment (1)
Manufacturer's ID	x	x	x	x
Model Designation	x	x	x	x
Serial Number and Prefix	x	x	x	x (2)
Certificate of Conformance Number (8)	x	x	x	x (8)
Minimum and Maximum Dimensions for Each Side (3)	x	x	x	
Value of Measuring Division, d	x	x	x	
Temperature Limits (4)	x	x	x	
Minimum & Maximum speed (5)	x	x	x	
Special Application (6)	x	x	x	
Limitation of Use (7)	x	x	x	

Amend Note 7 of Table S.4.1.b. Notes for Table S.4.1.a., as follows:

Multiple Dimension Measuring Systems Table S.4.1.b. Notes for Table S.4.1.a.	
1. Necessary to the dimension and/or volume measuring system, but having no effect on the measuring value, e.g., auxiliary remote display, keyboard, etc.	
2. Modules without "intelligence" on a modular system (e.g., printer, keyboard module, etc.) are not required to have serial numbers.	
3. The minimum and maximum dimensions can be shown as follows:	
Length:	min. _____ max. _____
Width:	min. _____ max. _____
Height:	min. _____ max. _____
4. Required if the range is other than -10 EC to 40 EC (14 EF to 104 EF).	
5. If the multiple dimension measuring device requires that the object or device be moved relative to one another, the minimum and maximum speeds are marked which enable the device to make measurements that are within the applicable tolerances shall be marked.	
6. A device designed for a special application rather than general use shall be conspicuously marked with suitable words visible to the operator and the customer restricting its use to that application.	
7. Materials, shapes, structures, <u>combination of object dimensions</u> , or object orientations that are inappropriate for the device or those that are appropriate.	
8. Required only if a Certificate of Conformance has been issued for the equipment.	

JUSTIFICATION: Some current device designs utilize a measurement pattern (as shown in example below) may not allow the device to measure to both the marked maximum height limit and the marked maximum width limit on the same object. The marked maximum height and width are individually correct with respect to the device capability. The minimum and maximum dimension requirements in Handbook 44 do not adequately address this scenario. Hbk 44 states that if an object exceeds the marked measuring limitation for any axis by 105 percent it must not display or record a value, or provide an error message. The largest object (object 3) in the example does not exceed the manufacturers marked capacity for height or width individually; however, the system is not capable of providing an accurate measurement for this object. Note 7 in Table S.4.1.a also does not specifically address this situation. The shape, structure, or orientation of object 3, individually, are not in themselves inappropriate for this device, but this particular combination of dimensions is beyond the device's capability.

Example:



REASONS FOR: At its July 2003 Meeting, the Multiple Dimension Measuring Devices Working Group agreed that the current 105 percent limit on overcapacity indication should be changed to the marked maximum plus 9 d for each dimension and/or total volume indicated. This change is consistent with the Measurement Canada requirement and other Handbook 44 Codes that have an overcapacity limit. The workgroup also agreed to forward the proposal shown above to the S&T Committee for consideration.

ADDITIONAL CONSIDERATIONS: This proposal originated from the July 2003 Meeting of the Multiple Dimension Measuring Devices Working Group. The Work Group supports the proposal. NCWM adoption of this item will aid in the effort to change the status of the Multiple Dimension Measuring Devices Code from tentative to permanent.

2003 WWMA Recommendation:

The WWMA heard comments from a manufacturer supporting the proposal.

The WWMA supports the proposal to align over-capacity indication limits with international recommendations.

WWMA S&T-23 VC

CONTACT PERSON: Richard Suiter

JURISDICTION: Multiple Dimension Measuring Devices Working Group

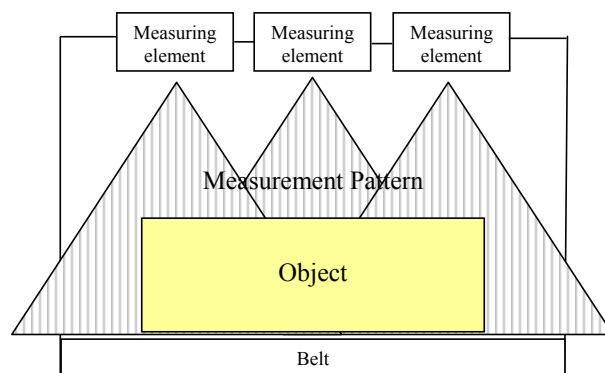
PROPOSAL CONSIDERED: Modify Handbook 44 5.58. Multiple Dimension Measuring Devices, paragraph S.3. as follows; and add a definition for the term "Measurement Field".

S.3. System with Two or More Measuring Elements. – A multiple dimension measuring system with a single indicating or recording element, or a combination indicating-recording element, that is coupled to two or more measuring elements with independent measuring systems, shall be provided with a means to prohibit the activation of any measuring element (or elements) not in use, and shall be provided with automatic means to indicate clearly and definitely which measuring element is in use.

Note: This requirement does not apply to devices that use multiple measuring elements within a device in combination to measure objects in the same measurement field.

Measurement Field – a region of space or the measurement pattern produced by the measuring instrument in which objects are placed or pass through, either singly or in groups, when being measured by a single device.

Example:



JUSTIFICATION: The original intent of this paragraph was to address more than one measuring element in separate locations within a facility that were all coupled to a single indicator. For example, in a shipping hub there may be multiple lines each measuring different objects to increase the shipping capacity of the facility. All the measuring lines may be connected to a single indicator. At least one manufacturer believes that some interpret the term “measuring element” as it applies to a device as shown in the example above. The problem arises if a relatively narrow box is placed on the belt such that only one or two of the measuring elements shown is to make measurements. The interpretation in question is that the device in the example would need to comply with S.3. by identifying the measuring element or elements involved in the measurement of a single object.

REASONS FOR: The recommendation is simply to clarify the intent and application of this section.

ADDITIONAL CONSIDERATIONS: This proposal originated from the July 2003 Meeting of the Multiple Dimension Measuring Devices Work Group. The Work Supports the proposal. NCWM adoption of this item will aid in the effort to change the status of the Multiple Dimension Measuring Devices Code from tentative to permanent.

2003 WWMA Recommendation:

The WWMA heard comments from a manufacturer supporting the proposal.

The WWMA recommends the following alternate language for the note to S.3. to clarify the intent of the proposal and editorially correct the language in the definition of “measurement field.”

Note: This requirement does not apply to multiple dimension measuring devices that use more than one measuring element in combination, within a single device, to measure objects in the same measurement field.

Measurement Field – a region of space or the measurement pattern produced by the measuring instrument in which objects are placed or passed through, either singly or in groups, when being measured by a single device.

WWMA S&T-24 VC

CONTACT PERSON: Richard Suiter

JURISDICTION: Multiple Dimension Measuring Devices
Working Group

PROPOSAL CONSIDERED: Modify Handbook 44 Section 5.58. Multiple Dimension Measuring Devices, by adding a new paragraph N.1.4.1. Test Objects and a definition for the term “Test Objects.”

Add new paragraph N.1.4.1., as follows:

N.1.4.1 Test Objects. –Verification of devices may be conducted using appropriate test objects of various sizes and of stable dimensions. The test objects shall be opaque, rigid, and with flat surfaces and well defined straight edges. Test objects may consist of rectangular boxes with dimensions which are known to an expanded uncertainty (coverage factor $k = 2$) of not more than one-fifth of the applicable device tolerance. The dimensions shall also be checked to the same uncertainty when used at the extreme values of the influence factors. The dimension of these objects shall lie within the range of values bounded by the minimum and maximum dimensions measurable by the device.

Comment: Canada Suggestion

The dimension of all test objects shall be verified using a reference standard that is traceable to NIST (or equivalent national laboratory) and meets the tolerances expressed in NIST Handbook 44 Fundamental Considerations, paragraph 3.2. (i.e., one-third of the smallest tolerance applied to the device).

Add a new definition to D. Definitions, as follows:

test object. – An object whose dimensions are verified by appropriate reference standards and intended to verify compliance of the device under test with certain metrological requirements.

JUSTIFICATION: Test standards similar to those developed by Canada for type approval are not currently available in the United States. Without available standards or standards specifications, it is difficult to ensure common test results from field inspections. Some state and local inspectors have conducted tests of multiple dimension measuring devices using packages that were available at the test site. If field officials choose to use on-site packages, great care must be taken in the selection of objects that are in very stable condition and can be compared to a certified length standard with an appropriate degree of uncertainty. Cardboard boxes are particularly subject to damage and deformity, and should only be used under tightly controlled conditions. Due to the relative uncertainty of the measurement process, multiple dimension measuring devices with a division size of less than 0.5 inch (1 cm) should only be tested with verified test standards. The Multiple Dimension Measuring Devices Code provides guidance regarding the appropriate size of test objects, but it does not provide any other criteria for what constitutes an appropriate test object. The term "test object" is also not defined in Handbook 44. OIML R 129 provides a definition for a test object and criteria for using test objects to verify the performance of multiple dimension measuring devices.

REASONS FOR: This paragraph provides field officials that do not have specifically designed dedicated standards for testing multiple dimension measuring devices with a mechanism for testing these devices, provided care is taken in developing proper reference standards. The mechanism can be compared to the testing of in-motion-monorail scales with carcasses. In both cases, care must be taken to verify that the standards are appropriate at the beginning of a test and remain stable throughout the entire test of the device.

ADDITIONAL CONSIDERATIONS: This proposal originated from the July 2003 Meeting of the Multiple Dimension Measuring Devices Work Group. The Work Group supports the proposal. NCWM adoption of this item will aid in the effort to change the status of the Multiple Dimension Measuring Devices Code from tentative to permanent.

2003 WWMA Recommendation:

The WWMA heard comments from a manufacturer supporting the proposal.

The WWMA S&T Committee is concerned about an apparent conflict with the language in the first proposed paragraph, stating that the expanded uncertainty of the test object must be known to one-fifth of the applicable device tolerance in field testing, as it relates to language in the second paragraph that states that the test object be verified using standards with an uncertainty less than one-third of the smallest tolerance applied to the device.

The WWMA S&T Committee recommends removing the expanded uncertainty language in the first paragraph as follows (the language deleted from the proposal may be more appropriate for standards used for type evaluation tests):

N.1.4.1 Test Objects. –Verification of devices may be conducted using appropriate test objects of various sizes and of stable dimensions. The test objects shall be opaque, rigid, and with flat surfaces and well defined straight edges. The dimension of these objects shall lie within the range of values bounded by the minimum and maximum dimensions measurable by the device.

The dimension of all test objects shall be verified using a reference standard that is traceable to NIST (or equivalent national laboratory) and meets the tolerances expressed in NIST Handbook 44 Fundamental Considerations, paragraph 3.2, (i.e., one-third of the smallest tolerance applied to the device).

WWMA S&T-25 VC

CONTACT PERSON: Richard Suiter

JURISDICTION: Multiple Dimension Measuring Devices
Working Group

PROPOSAL CONSIDERED: Modify Handbook 44 5.58. Multiple Dimension Measuring Devices, paragraph T.5.2. Power Supply Voltage as follows and remove paragraph T.7. Electric Power Supply.

Amend T.5.2., as follows:

T.5.2. Power Supply Voltage. - ~~Devices shall satisfy the applicable tolerances when subjected to power supply voltage variation of -15 percent to +10 percent of the voltage rating specified by the manufacturer.~~

Add new paragraphs T.5.2.1. and T.5.2.2., as follows:

T.5.2.1. Alternating Current Power Supply. - Devices that operate using alternating current must perform within the conditions defined in paragraphs T.2. through T.4., inclusive, over the nominal line voltage with the tolerance of -15 percent to +10 percent of the nominal, or the range as marked by the manufacturer. (Range takes precedence).

T.5.2.2. Direct Current Power Supply. - Devices that operate using direct current shall operate and perform within the applicable tolerance at any voltage level at which the device is capable of displaying metrological registrations. (Added 200X)

Delete T.7., as follows:

~~**T.7. Electric Power Supply.** - **Battery-operated instruments shall not indicate nor record values outside the applicable tolerance limits when battery power output is excessive or deficient.**~~
(Added 1999)

JUSTIFICATION: The requirements currently in T.5.2. and T.7. do not clearly distinguish between alternating current and direct current power supplies. The language is also not consistent with similar requirements in other Handbook 44 Codes, such as T.N.8.3. in the Scales Code or T.3. in the Automatic Weighing Systems Code.

REASONS FOR: All codes should be consistent and, where possible, should harmonize with international requirements.

ADDITIONAL CONSIDERATIONS: This proposal originated from the July 2003 Meeting of the Multiple Dimension Measuring Devices Work Group. The Working Group supports the proposal. NCWM adoption of this item will aid in the effort to change the status of the Multiple Dimension Measuring Devices Code from tentative to permanent.

2003 WWMA Recommendation:

The WWMA heard comments from a manufacturer supporting the proposal.

The WWMA supports the proposal as submitted. WWMA recommends that the NCWM S&T Committee move the proposal forward as a voting item.

WWMA S&T-26 VC

CONTACT PERSON: Richard Suiter

JURISDICTION: Multiple Dimension Measuring Devices
Working Group

PROPOSAL CONSIDERED: Modify Handbook 44 5.58. Multiple Dimension Measuring Devices, paragraph T.3. Tolerance Values as follows:

T.3. Tolerance Values. - ~~The maintenance and acceptance tolerance values shall be ± 1 division. These tolerances apply regardless of the shape or material of the object being measured unless otherwise marked on the device.~~

JUSTIFICATION: The present wording of this section seems to imply that multiple tolerances are permitted on a system if they are marked on the device. Tolerances applicable to devices performing similar or duplicative functions should be equivalent.

REASONS FOR: At the July 2003 Meeting of the Multiple Dimension Measuring Devices Work Group, one member of the Work Group indicated that his company believes that T.3. should be clarified and that the entire second sentence in the paragraph is unnecessary and could be misleading.

ADDITIONAL CONSIDERATIONS: This proposal originated from the July 2003 Meeting of the Multiple Dimension Measuring Devices Working Group. The Work Group supports the proposal. NCWM adoption of this item will aid in the effort to change the status of the Multiple Dimension Measuring Devices Code from tentative to permanent.

2003 WWMA Recommendation:

The WWMA heard comments from a manufacturer supporting the proposal.

The WWMA agrees with the proposal as submitted. WWMA recommends that the NCWM S&T Committee move the proposal forward as a voting item.

Committee on Specifications and Tolerances

Kurt E. Floren, County of San Diego, CA – Chairman (1)

Raymond Johnson, New Mexico (2)

Manuel Villicana, Kern County, CA (3)

Greg Mukai, California (Annual)

Brett Saum, San Luis Obispo County, CA (Annual)

Jack Kane, Montana (Ex-Officio)

Steve Cook, NIST, Technical Advisor